

VOL. XXXIX No. 4

APRIL 1954

# MECCANO

## MAGAZINE



WESTWARD-HO!

1/-



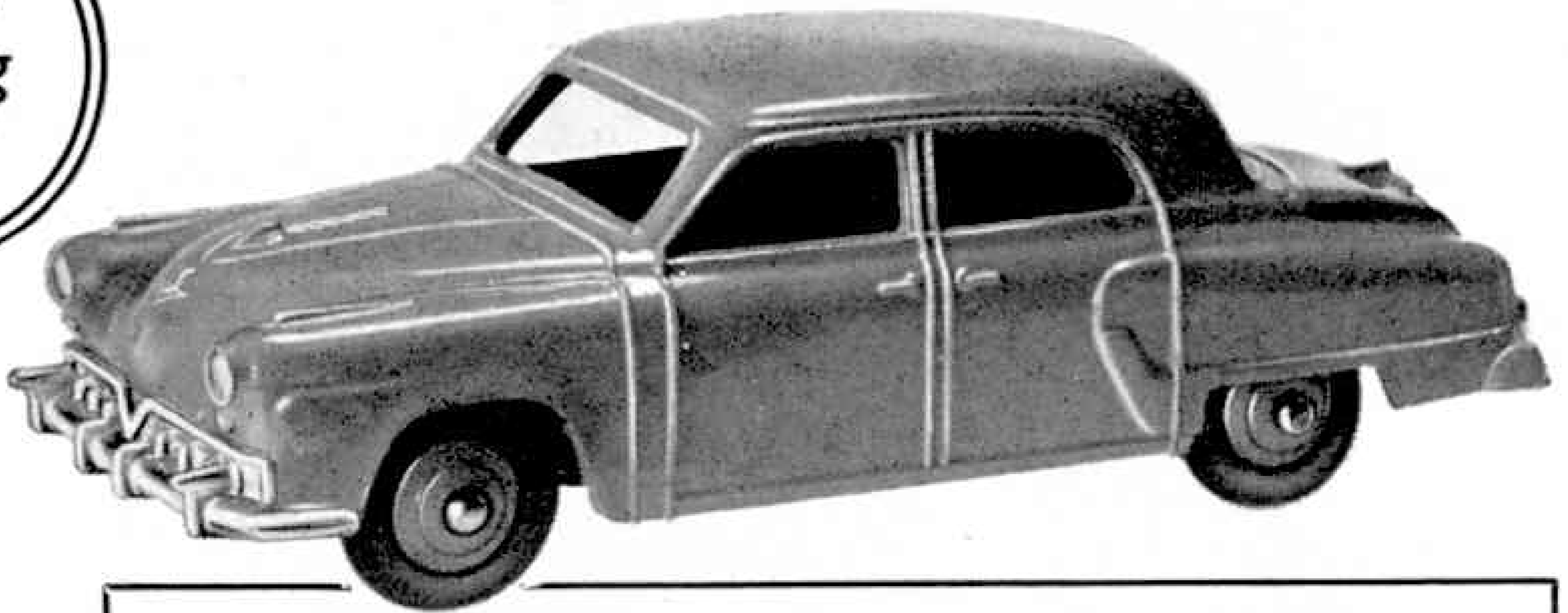
**NEW**

THE MECCANO MAGAZINE

# DINKY TOYS

TRADE MARK REGD.

Ready  
during  
April

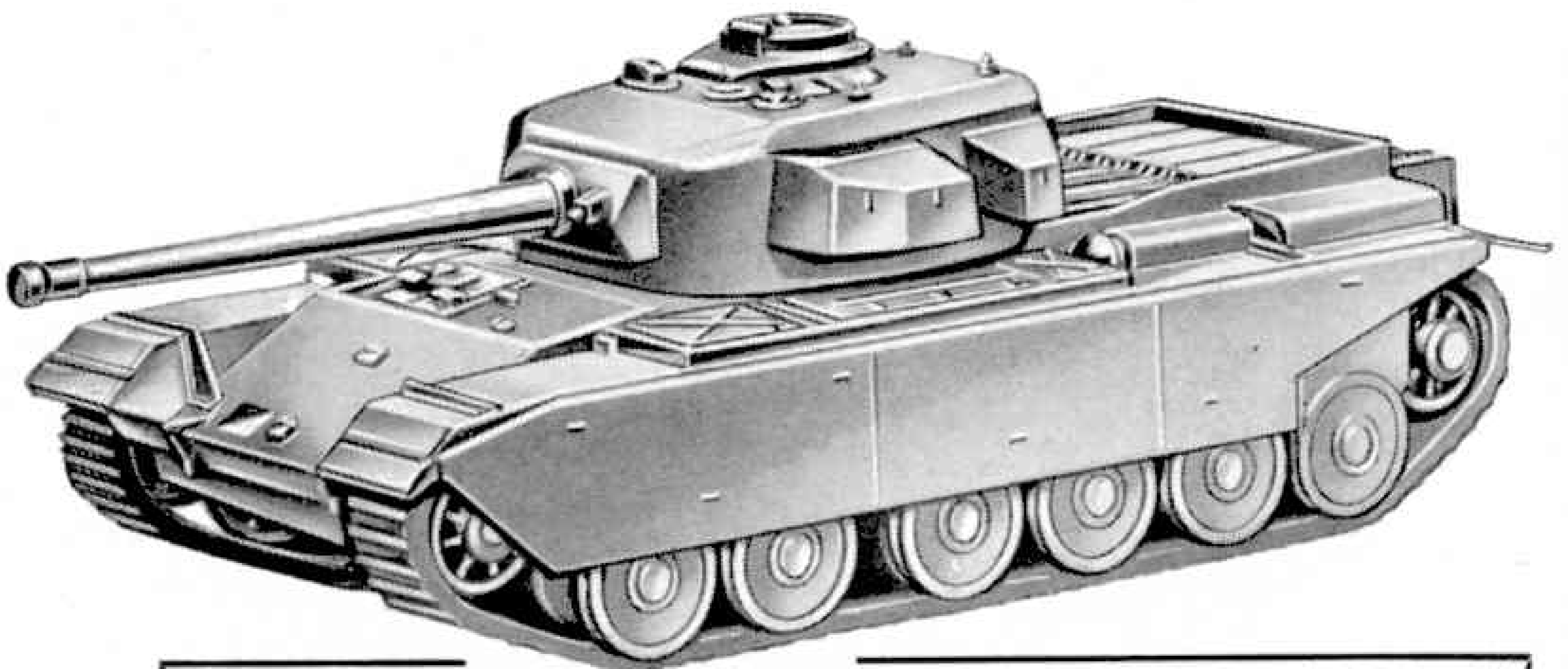


## STUDEBAKER LAND CRUISER NO. 172

A special  
article on  
these  
interesting  
new models  
will appear  
in the  
May issue

The name Studebaker belongs to one of America's leading car manufacturers, and the excellent Dinky Toys model of the Studebaker Land Cruiser reproduces the distinctive features of this popular and characteristically-American saloon. It is available in royal blue or light green. Overall length  $4\frac{1}{4}$  in.

PRICE 2/8



## CENTURION TANK NO. 651

Prices  
include  
Purchase  
Tax

Just look at the remarkable detail on this exciting model of Britain's famous 52-ton, 25 m.p.h. Centurion Tank. It measures 5 in. in length, has a swivelling gun turret, and rubber creeper tracks. Finished in Service green with the Royal Armoured Corps sign on front and rear, it is a welcome reinforcement for the playroom army.

PRICE 7/11

MADE IN ENGLAND BY MECCANO LIMITED

# DINKY TOYS

TRADE MARK REGD.



No. 157  
Jaguar XK120 Coupé  
Length  $3\frac{7}{8}$  in. 2/8



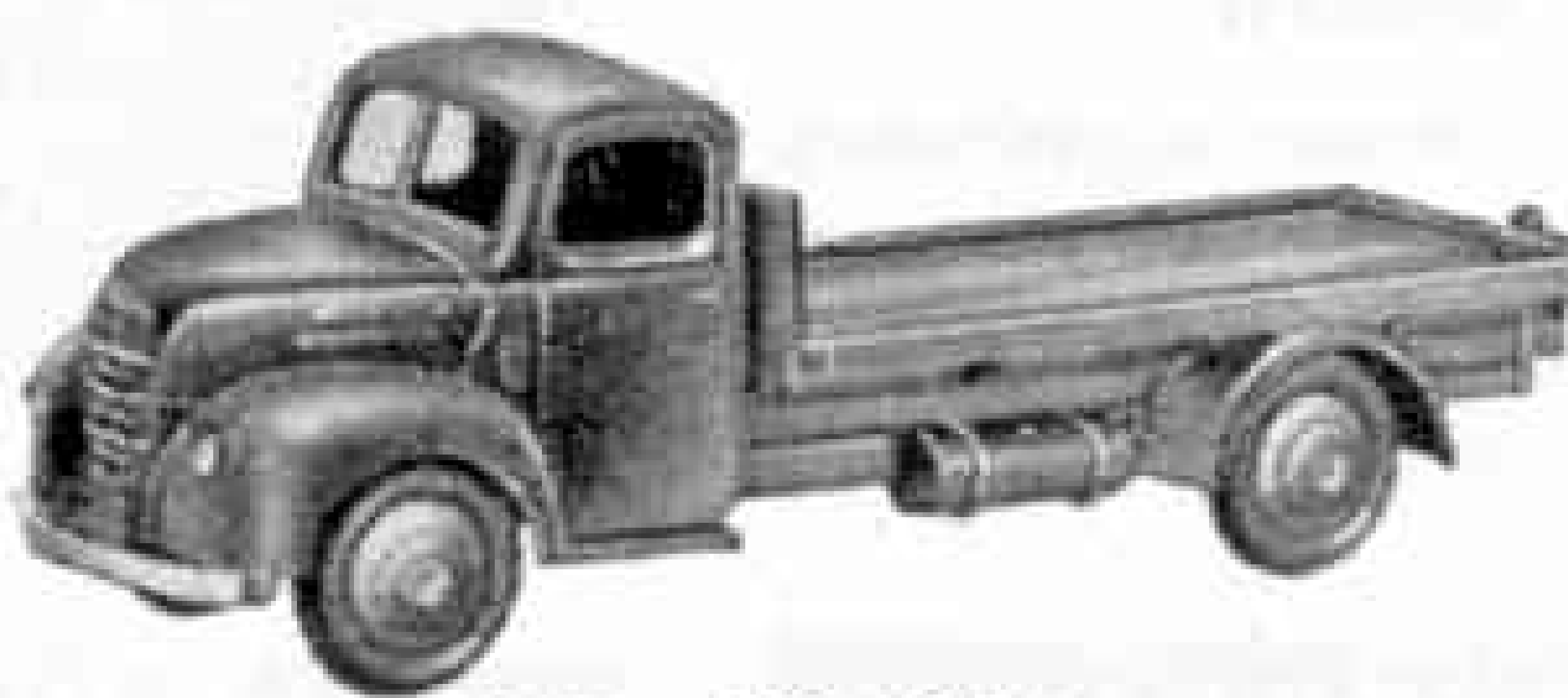
No. 430 (25x)  
Breakdown Lorry  
Length  $4\frac{3}{4}$  in. 5/6



No. 623  
Army Covered Wagon  
Length  $3\frac{7}{8}$  in. 3/7



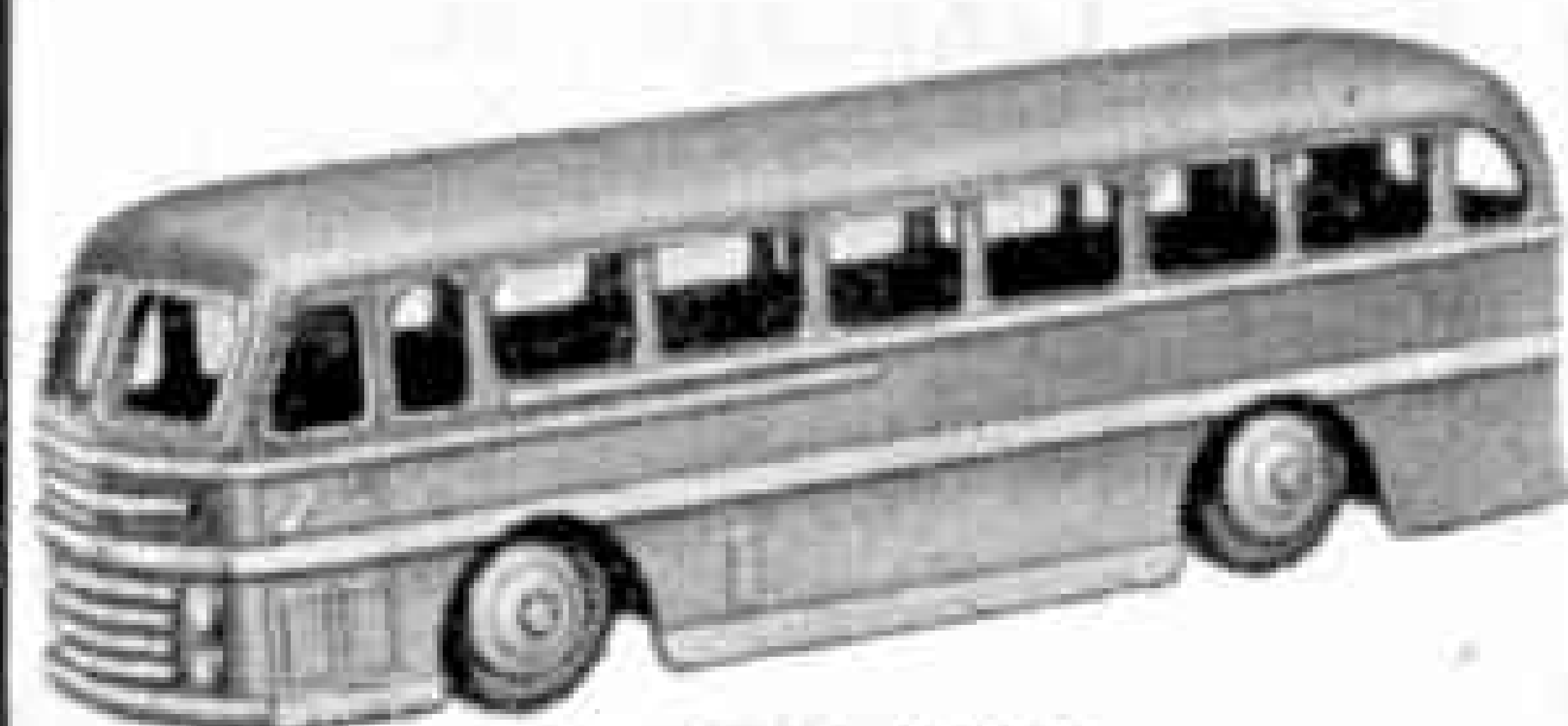
No. 673  
Scout Car  
Length  $2\frac{5}{8}$  in. 2/11



No. 422 (30r)  
Fordson "Thames" Flat  
Truck  
Length  $4\frac{1}{8}$  in. 2/6



No. 253 (30h)  
Daimler Ambulance  
Length  $3\frac{3}{4}$  in. 2/11



No. 282 (29h)  
Duple Roadmaster Coach  
Length  $4\frac{5}{8}$  in. 3/6



No. 235 (23j)  
H.W.M. Racing Car  
Length  $3\frac{7}{8}$  in. 2/6



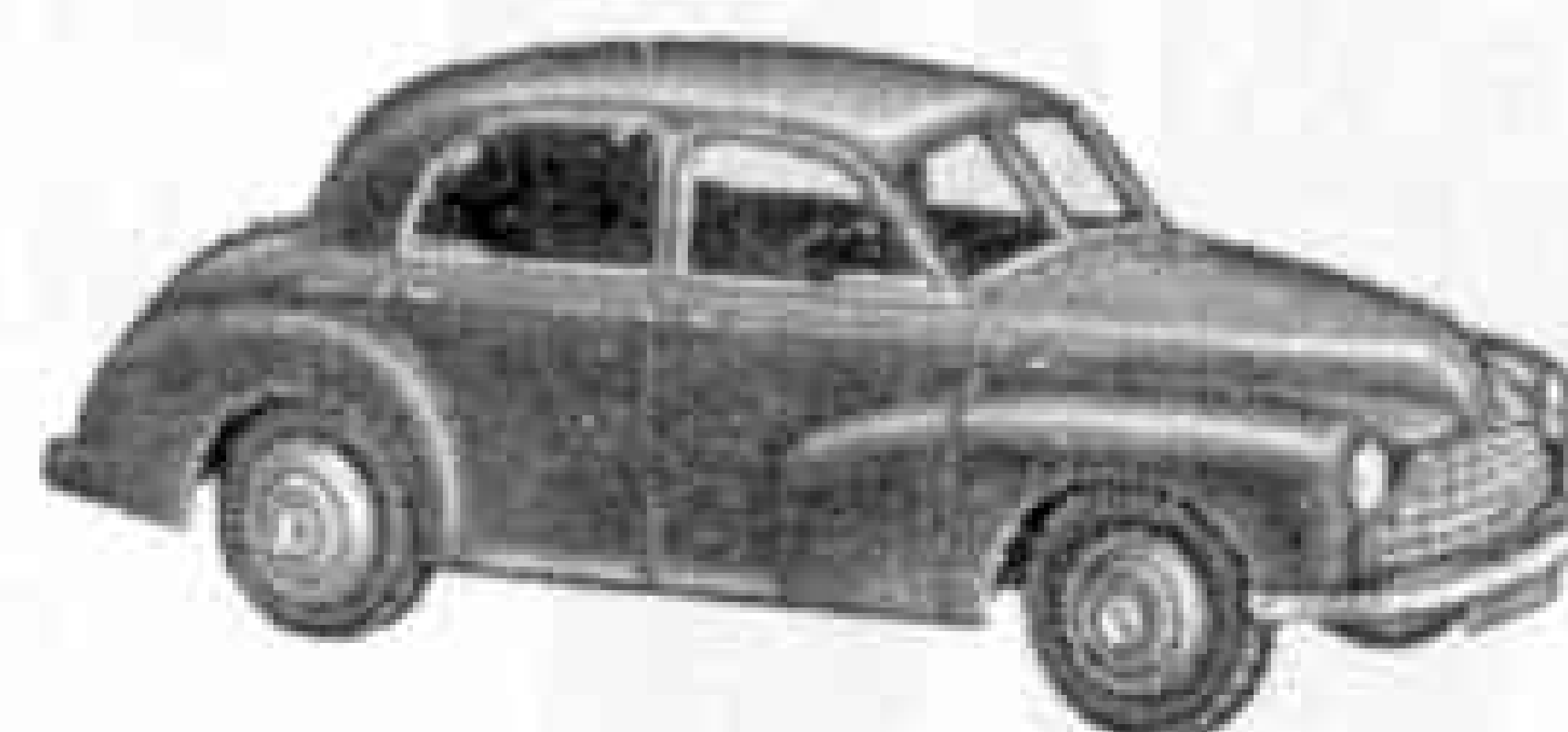
No. 301 (27n)  
Field-Marshall Tractor  
Length 3 in. 4/6



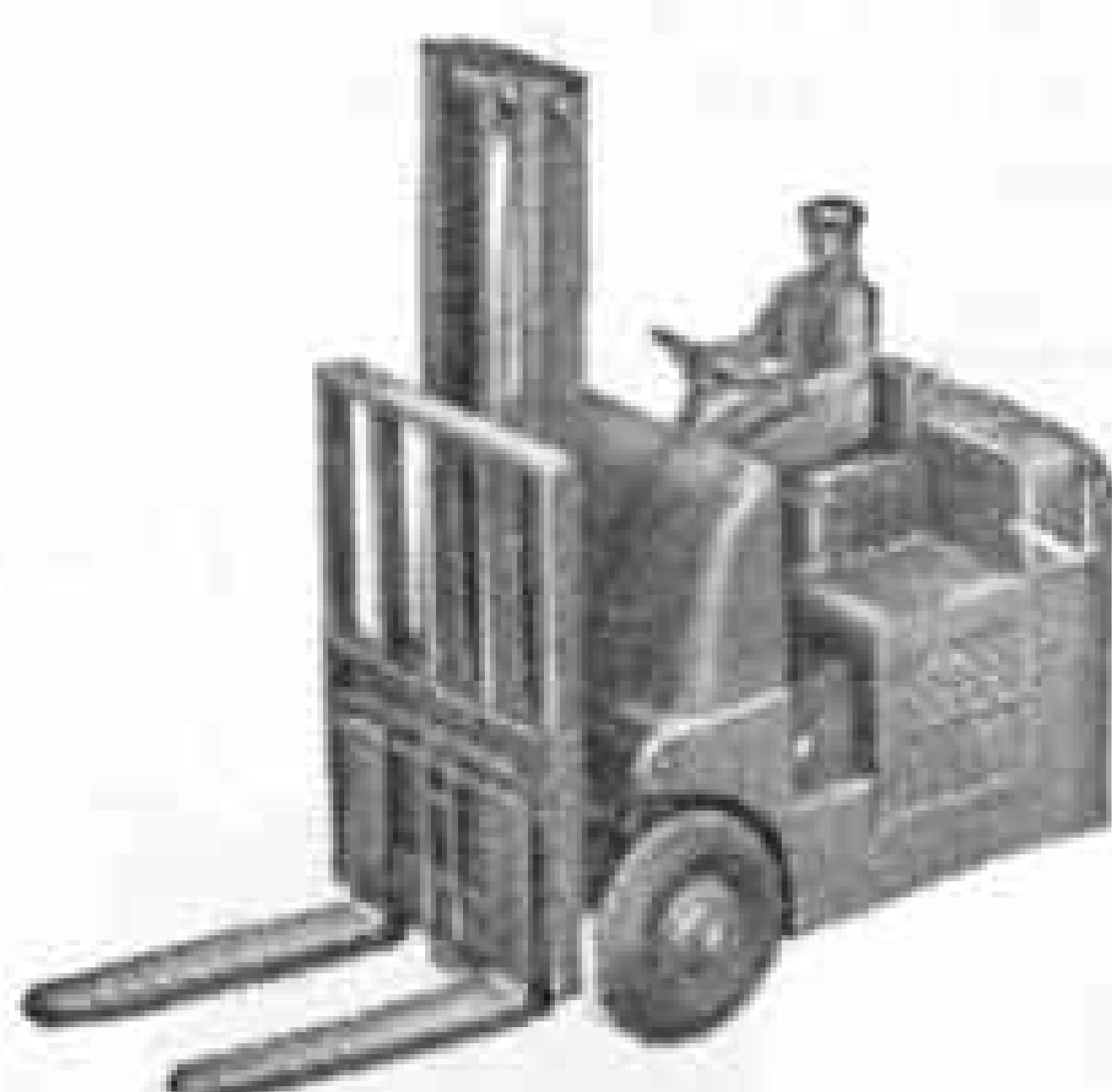
No. 161 (40j)  
Austin Somerset Saloon  
Length  $3\frac{1}{2}$  in. 2/2



No. 158 (40a)  
Riley Saloon  
Length  $3\frac{1}{2}$  in. 2/2



No. 159 (40g)  
Morris Oxford Saloon  
Length  $3\frac{5}{8}$  in. 2/2



No. 401 (14c)  
Coventry Climax  
Fork Lift Truck  
Length  $4\frac{1}{4}$  in. 6/6



No. 955 (555) Fire Engine  
with Extending Ladder  
Length  $5\frac{3}{8}$  in. 7/3

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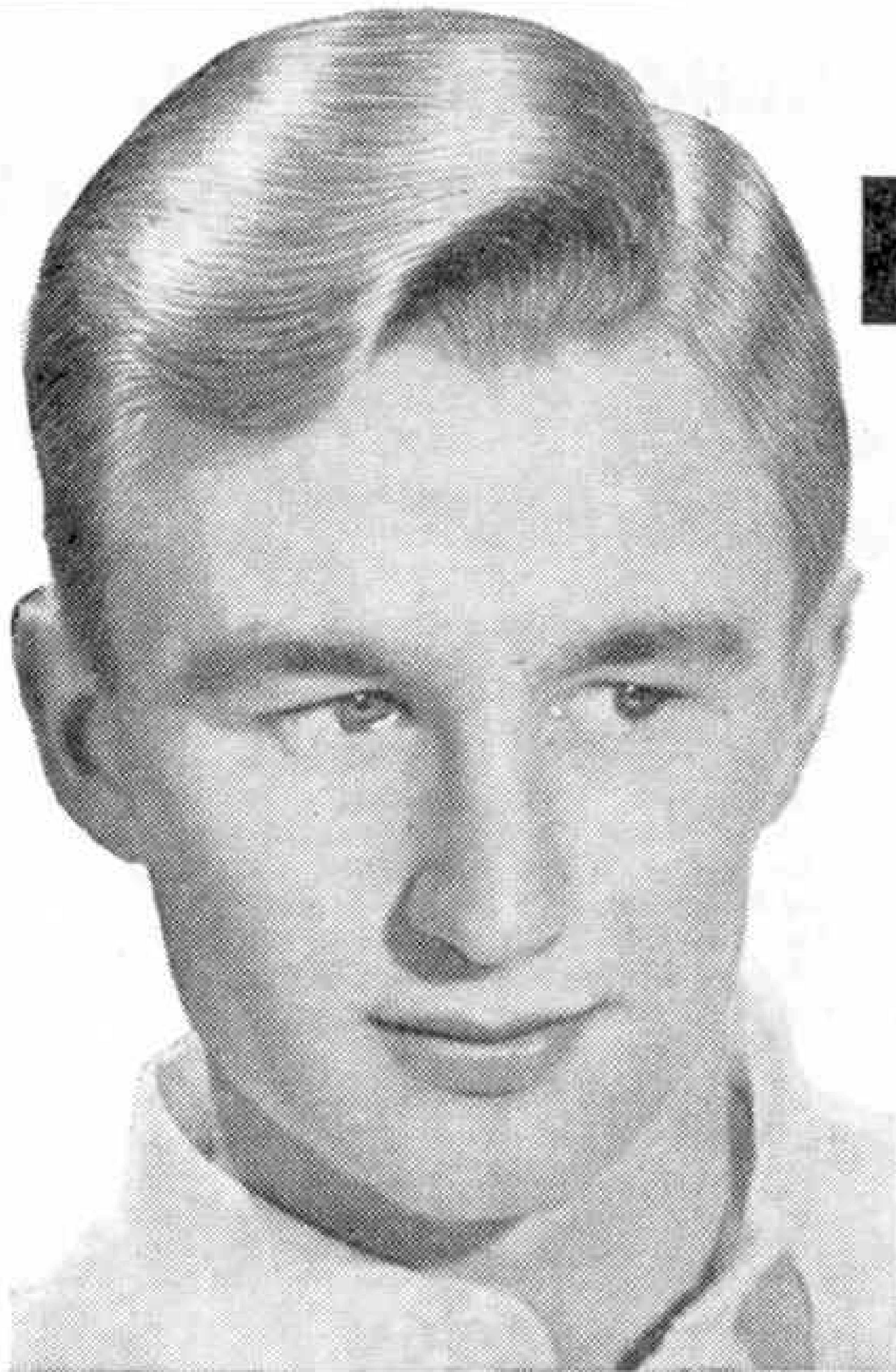
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royds 162/38

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Brickplayer Kit 4.....47/6

Accessory Kit 3a, which converts Kit 3 into Kit 4.....25/6

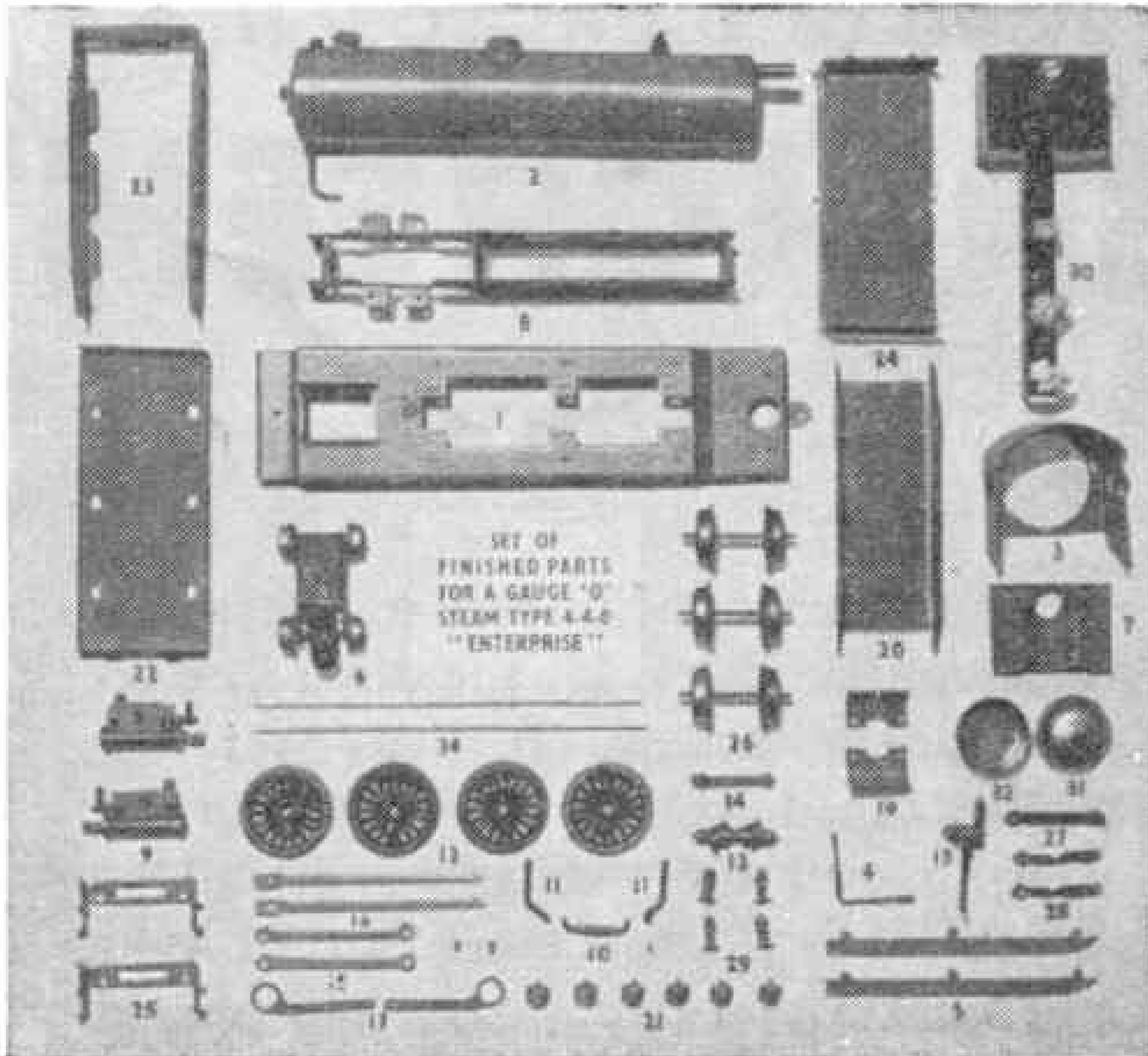
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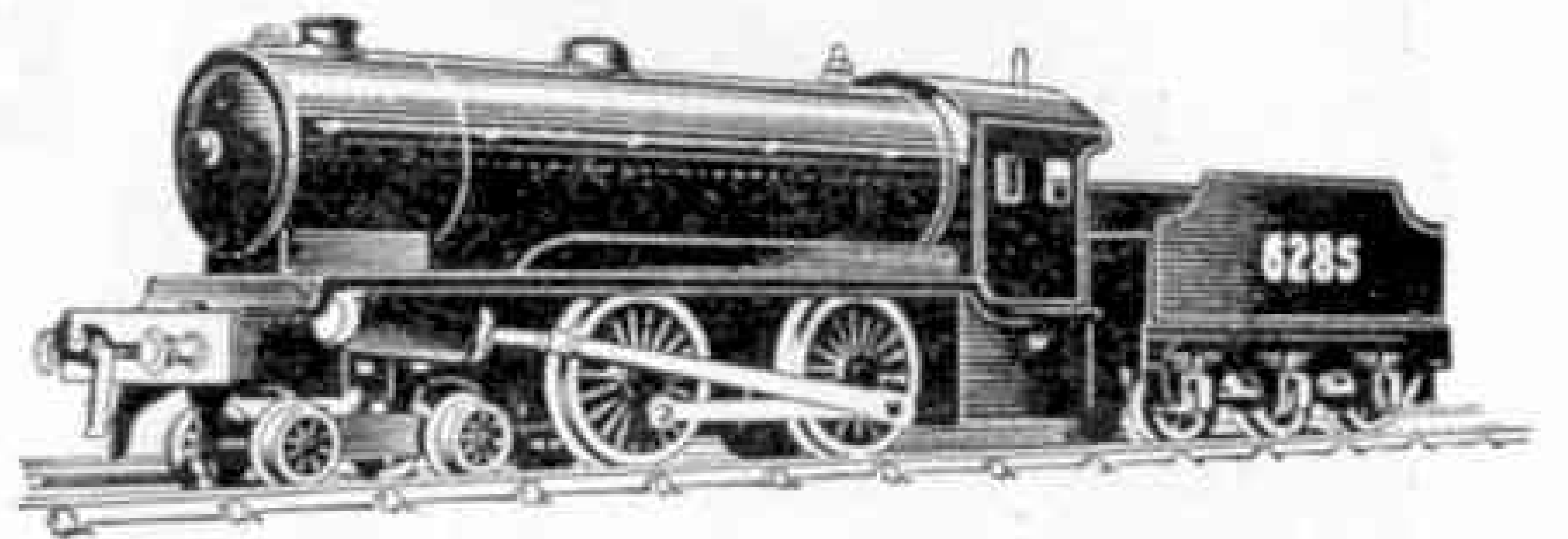
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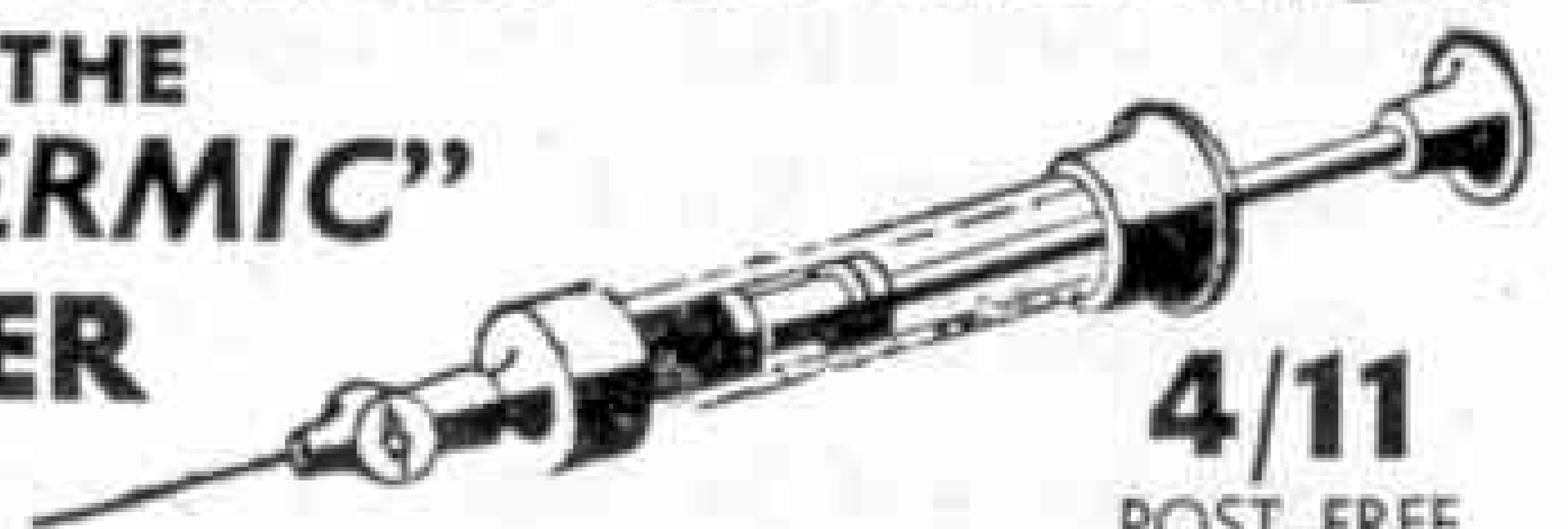
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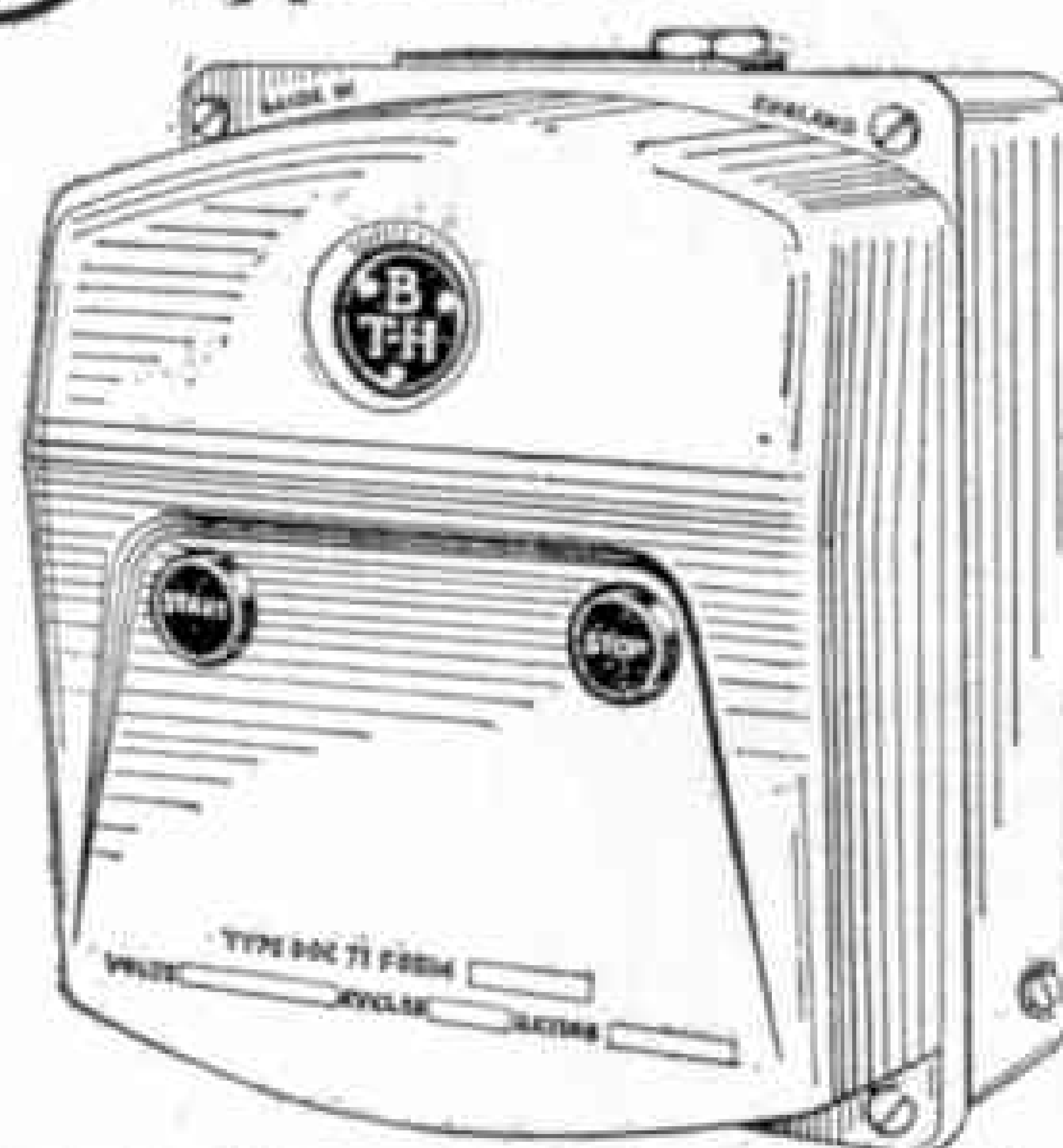
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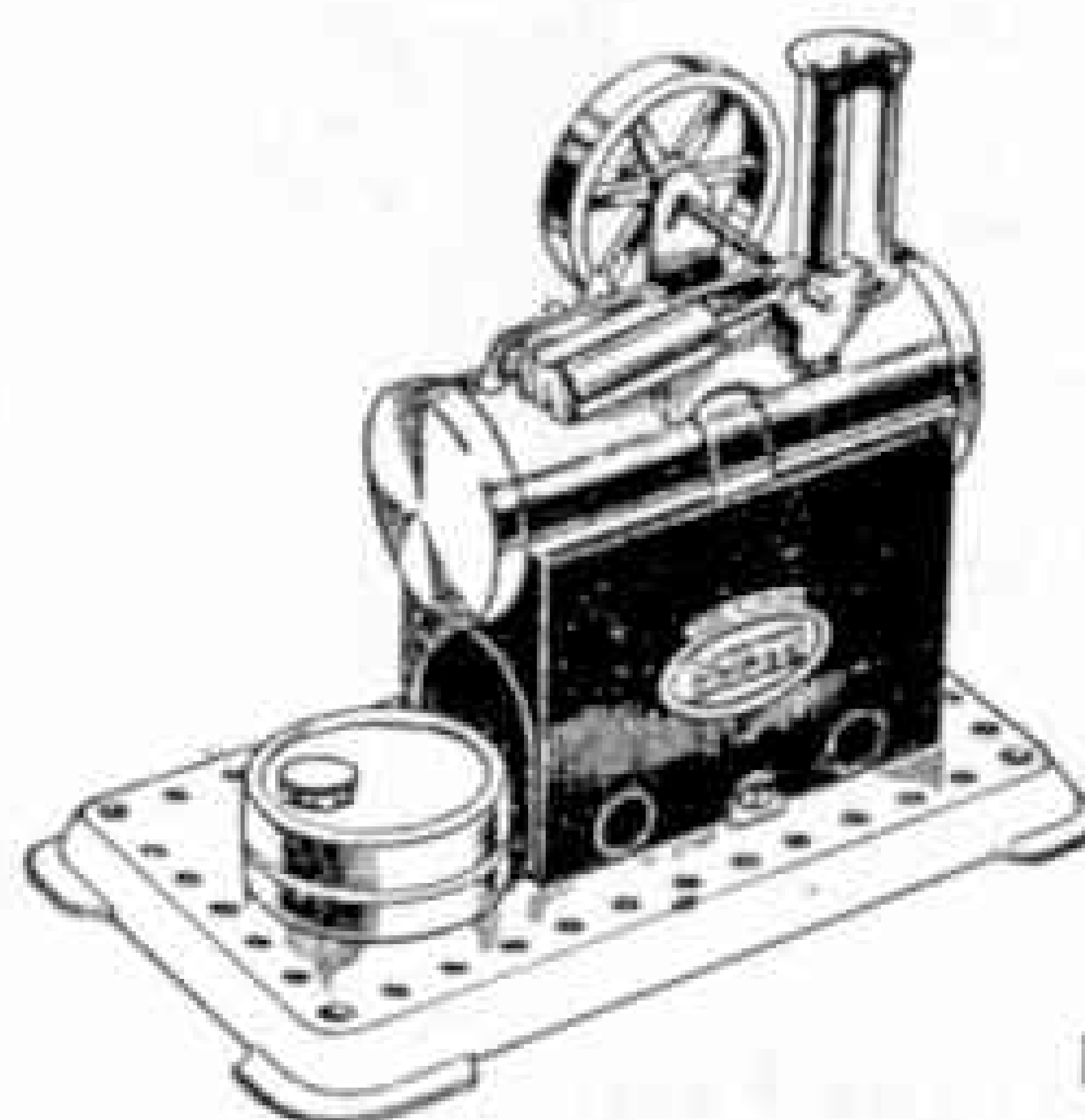
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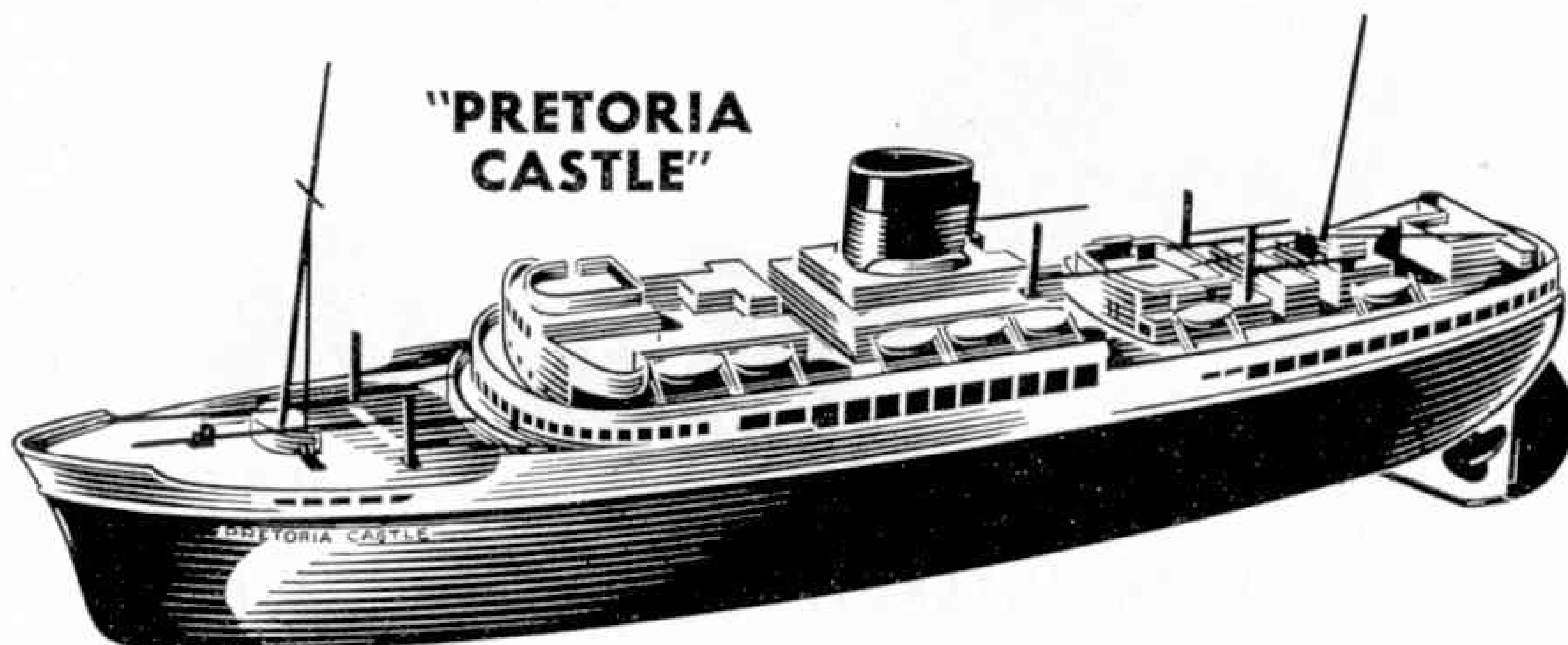
# Tri-ang

Regd. Trade Mark

SCALE  
MODEL  
*Watercraft*



## LOOK AT THIS, CHAPS!



**"PRETORIA  
CASTLE"**

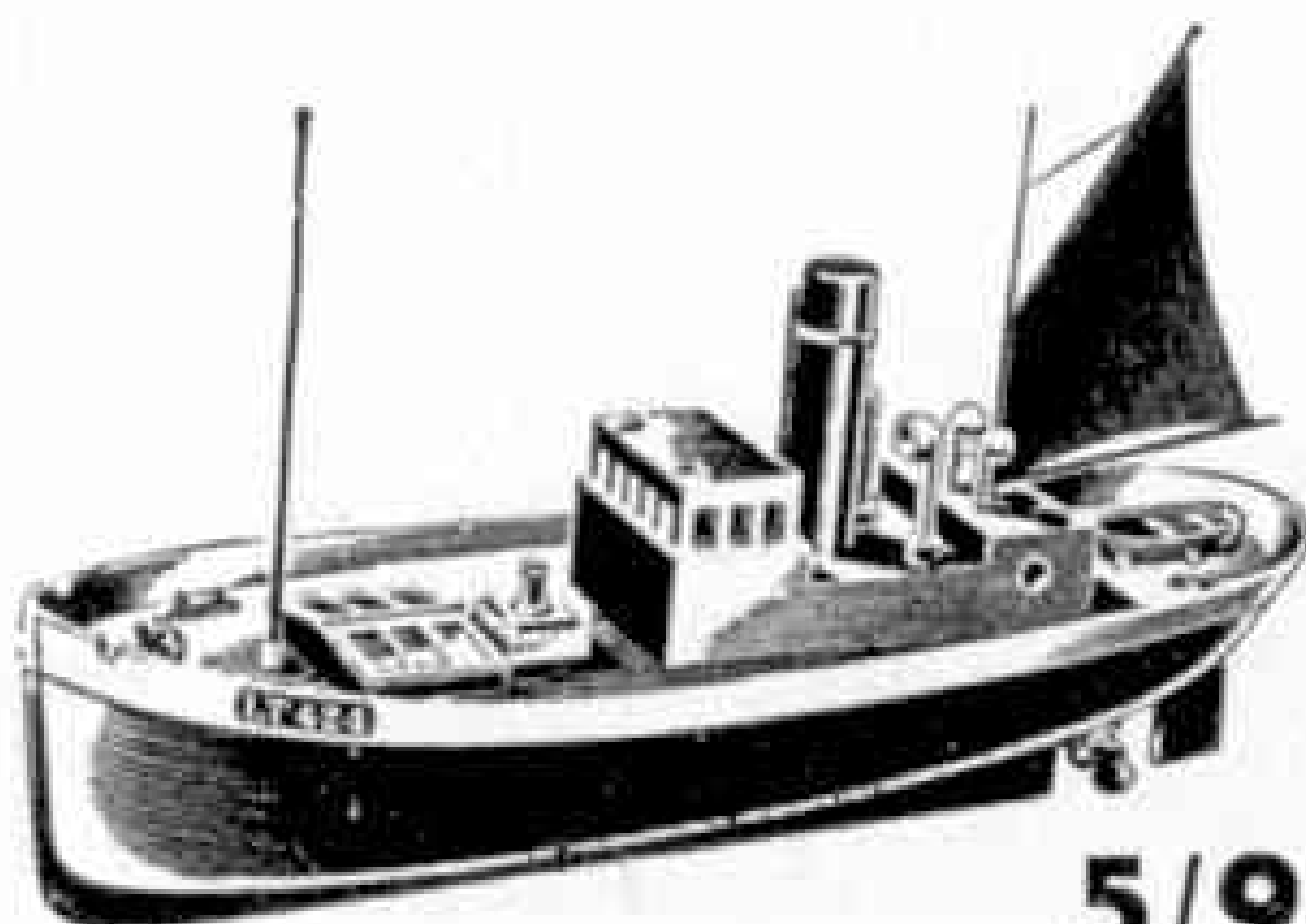
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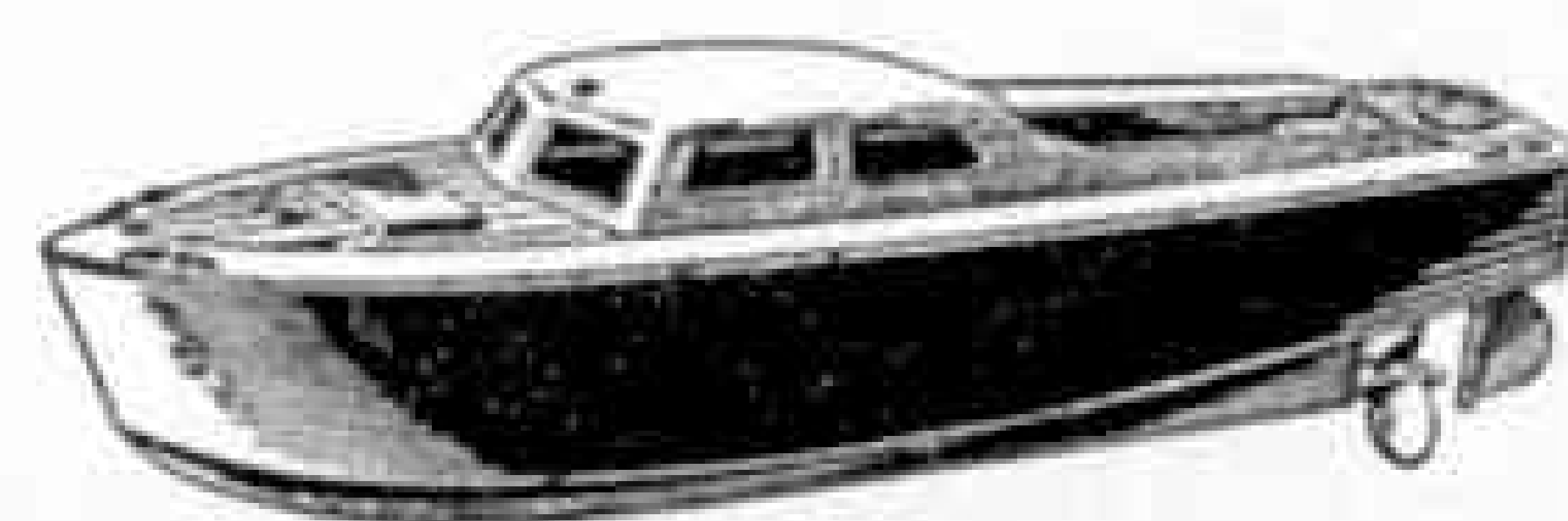
PENGUIN  
16 in. OCEAN  
RACING YACHT

**27/6**



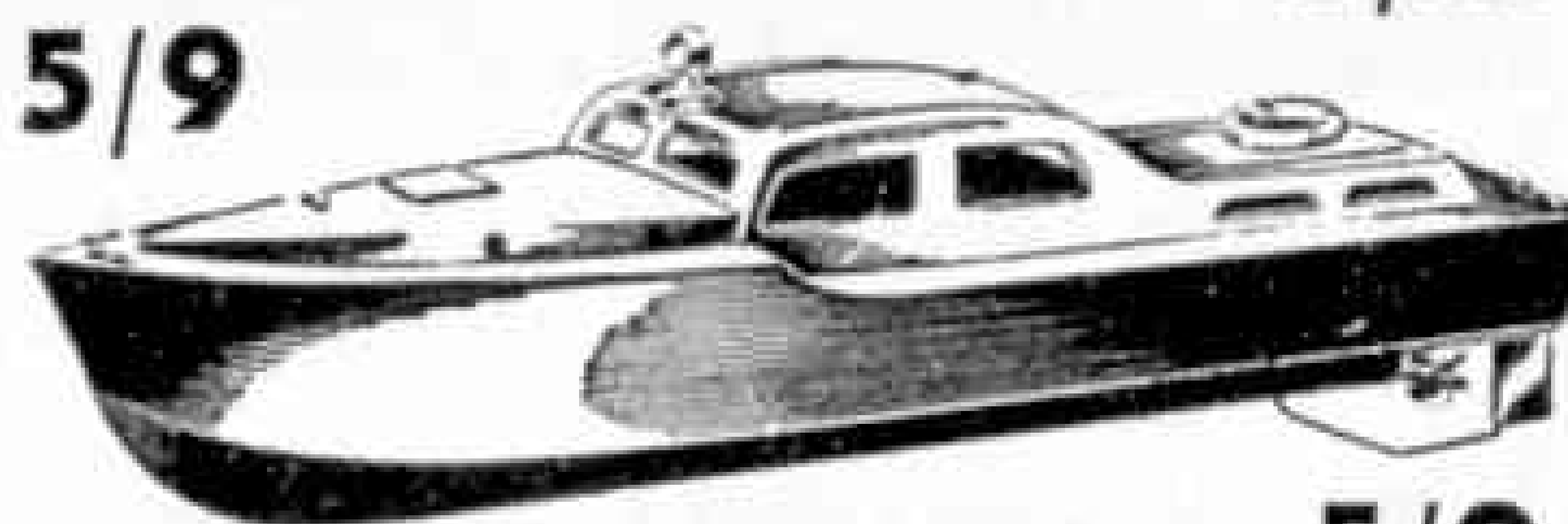
PENGUIN  
CLOCKWORK  
7 1/2 in. DRIFTER

**5/9**



PENGUIN CLOCKWORK 6 in.  
CABIN CRUISER

**2/11**



PENGUIN  
9 in. CLOCKWORK  
"SOLENT" CRUISER

**5/9**

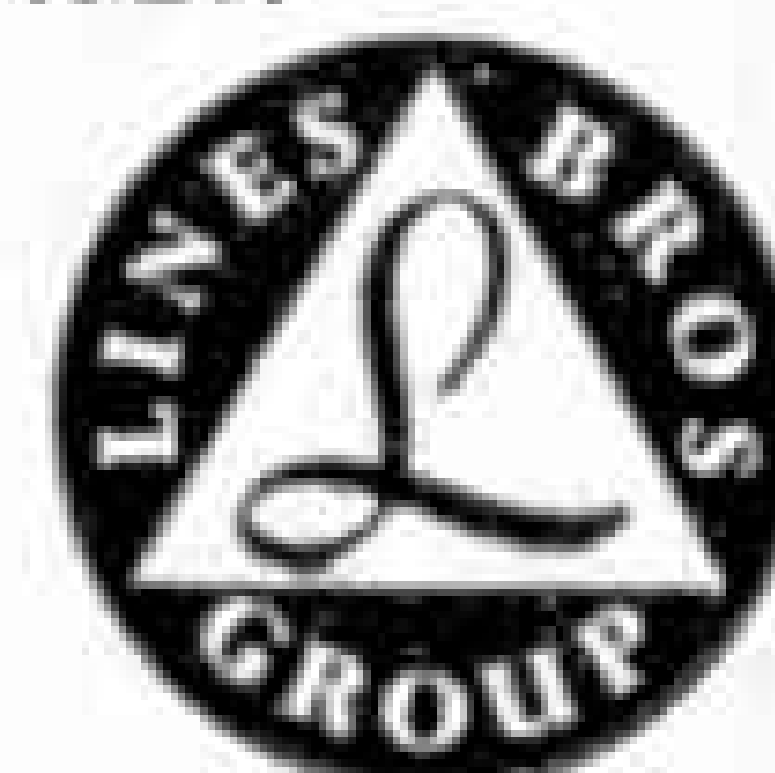


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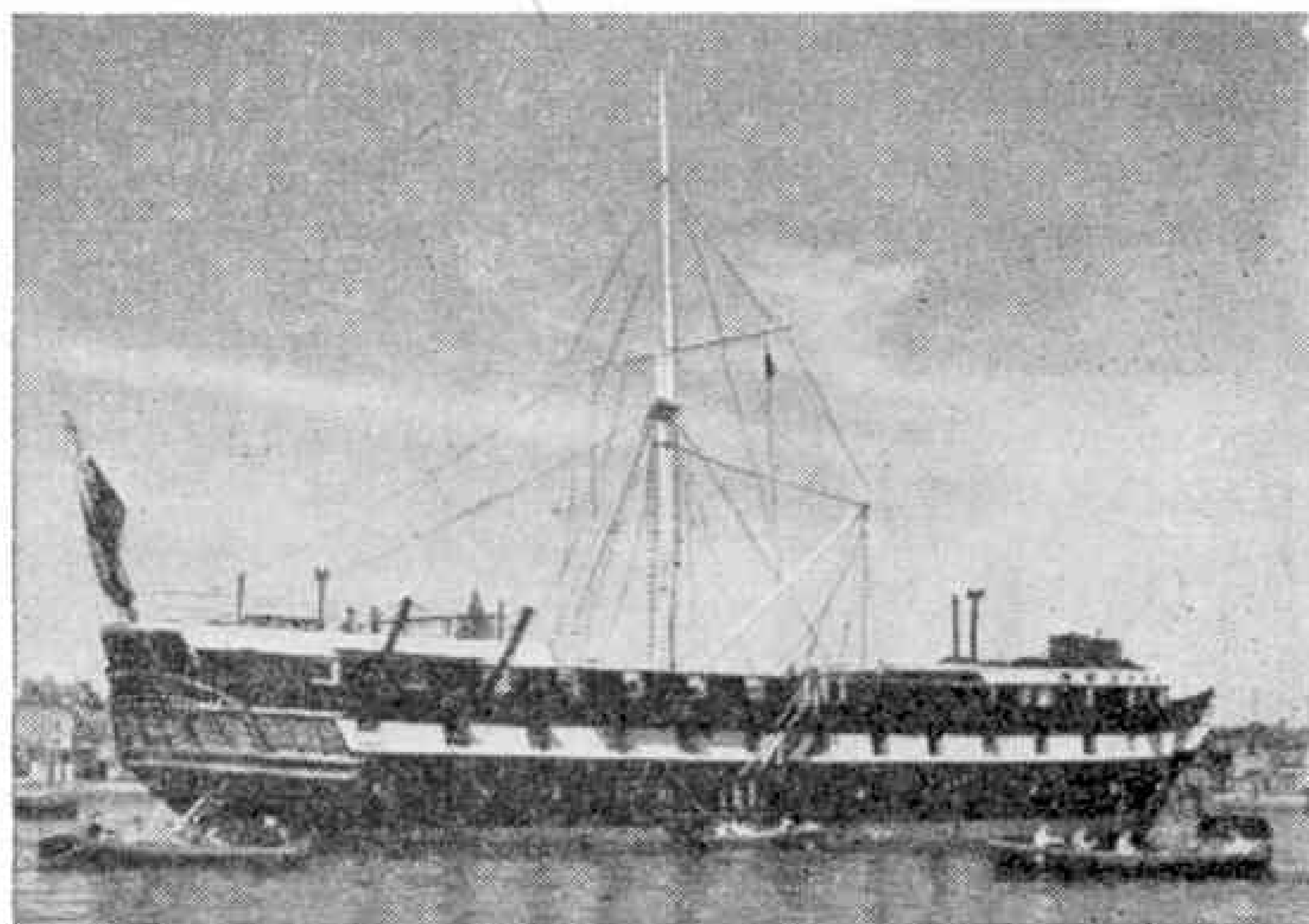
# Boy's Own

PAPER

PACKED WITH INTEREST FOR THE MODERN BOY

## The excitement of the Rally

Headlights on an icy road . . . precision of action on nerve-testing corners . . . Charles Fothergill takes you behind the scenes at the Monte Carlo Rally. Two exciting stories, Ross Salmon's Dwarf Jaguar and Joseph Chipperfield's Moorland Pursuit, features on Korfball, ocean racing, British birds, the hundredth Boat Race, aeromodelling, the ejection escape seat, cycling, stamps, jokes and cartoons, make the April B.O.P. an attraction that no-one should miss. Don't wait—see your newsagent today!



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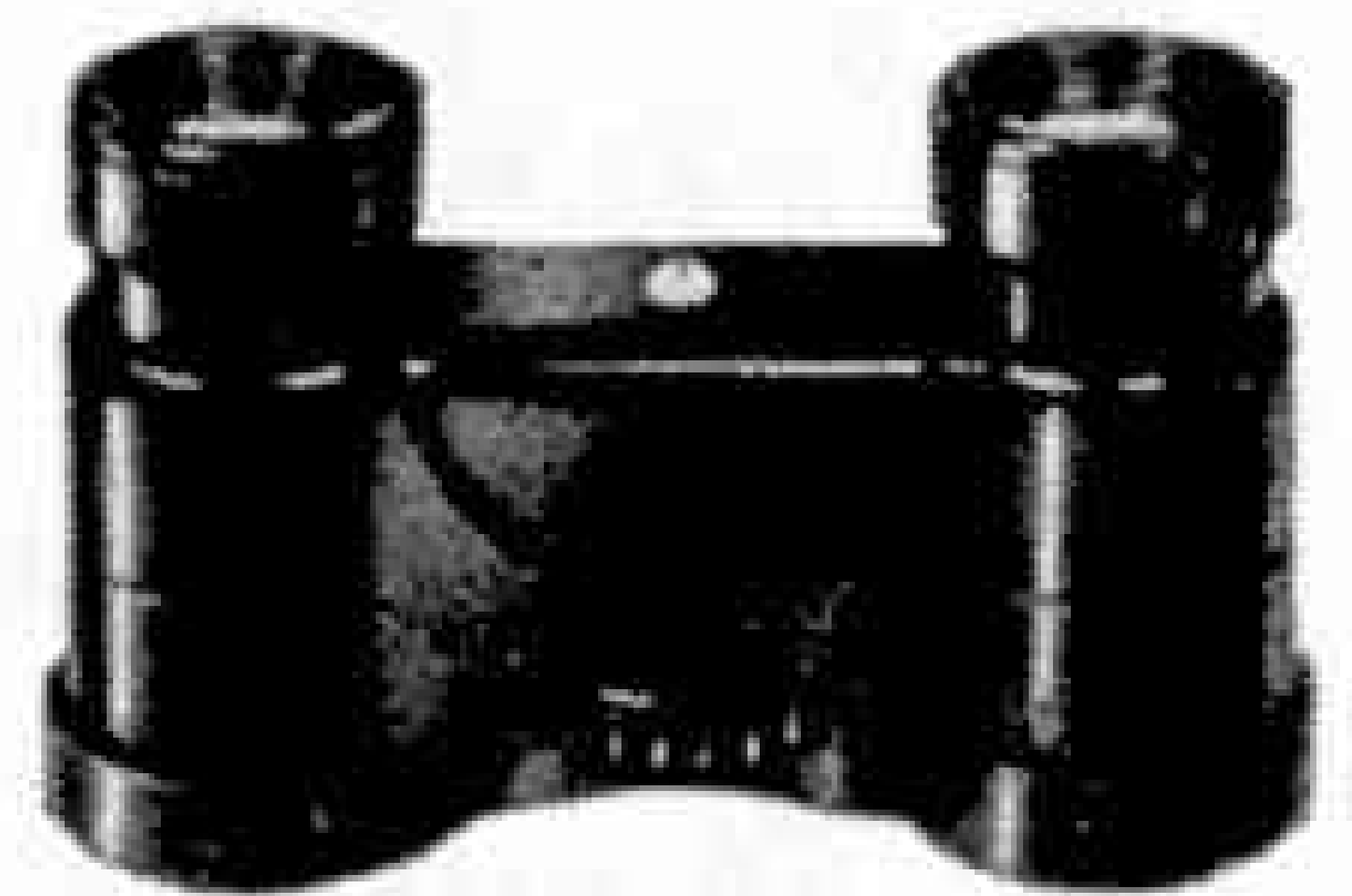
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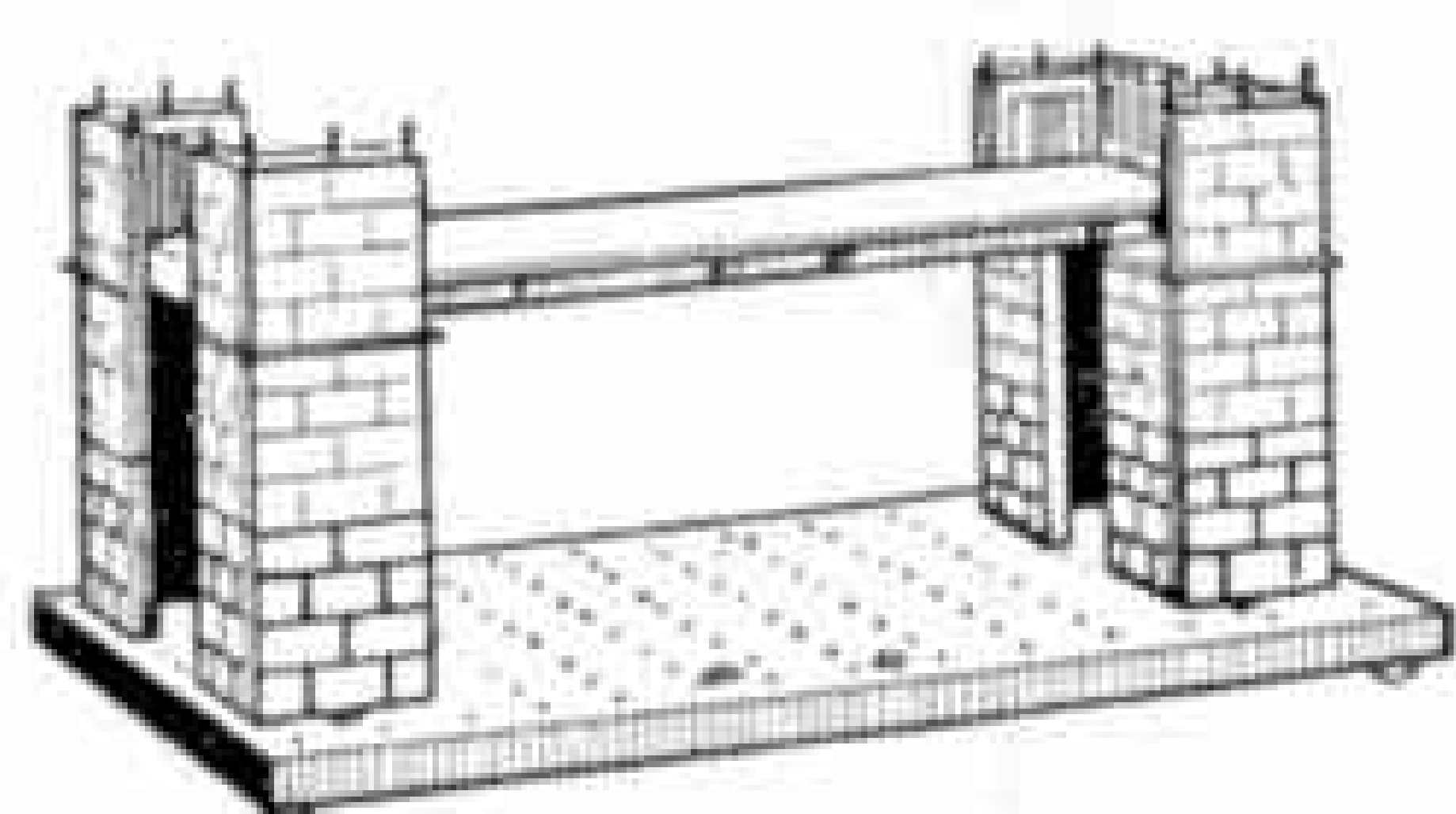
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Halt**

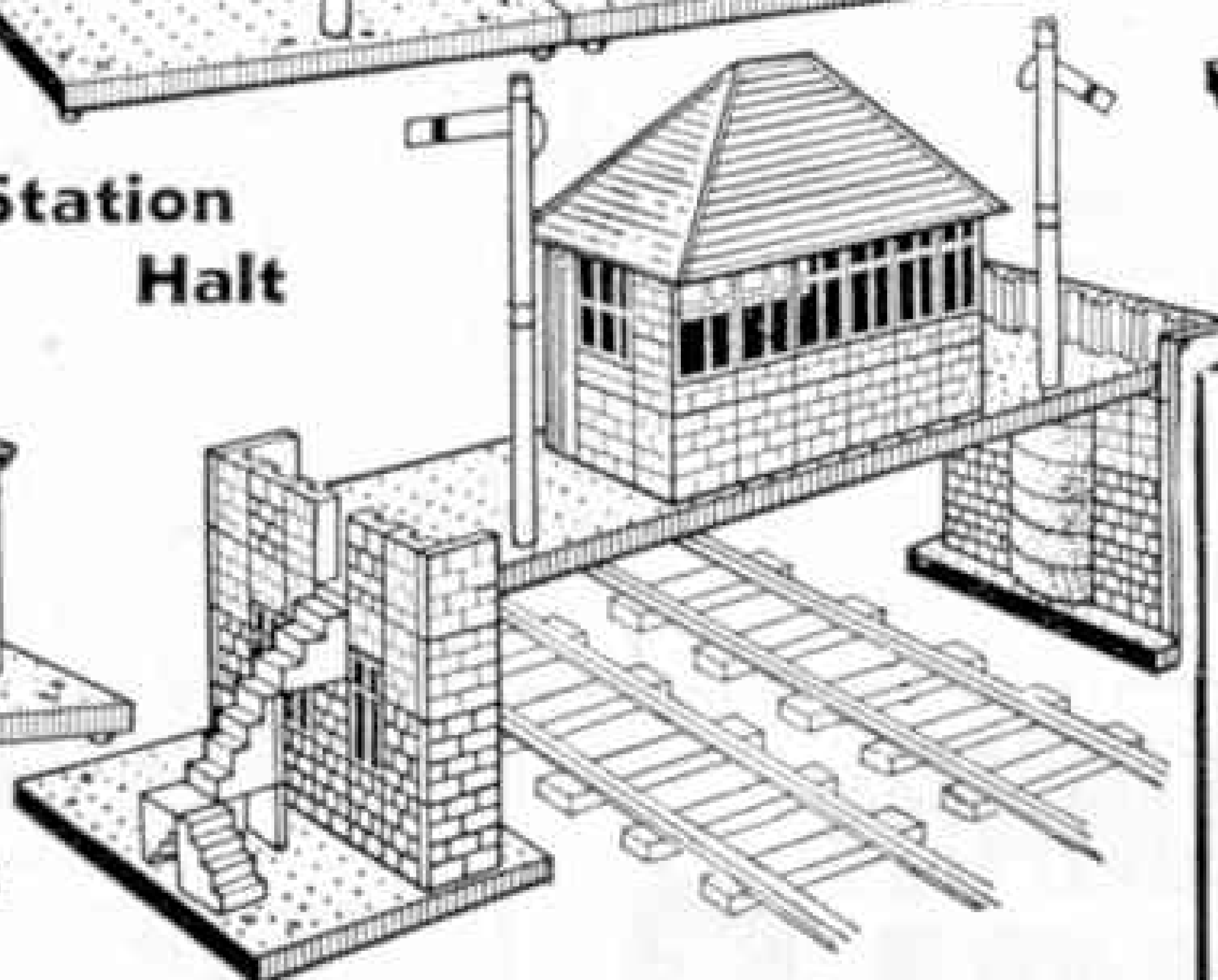


**Signal Box**



**Railway Booking Halt**

—and lots of other  
buildings



**Bridge Signal Box**

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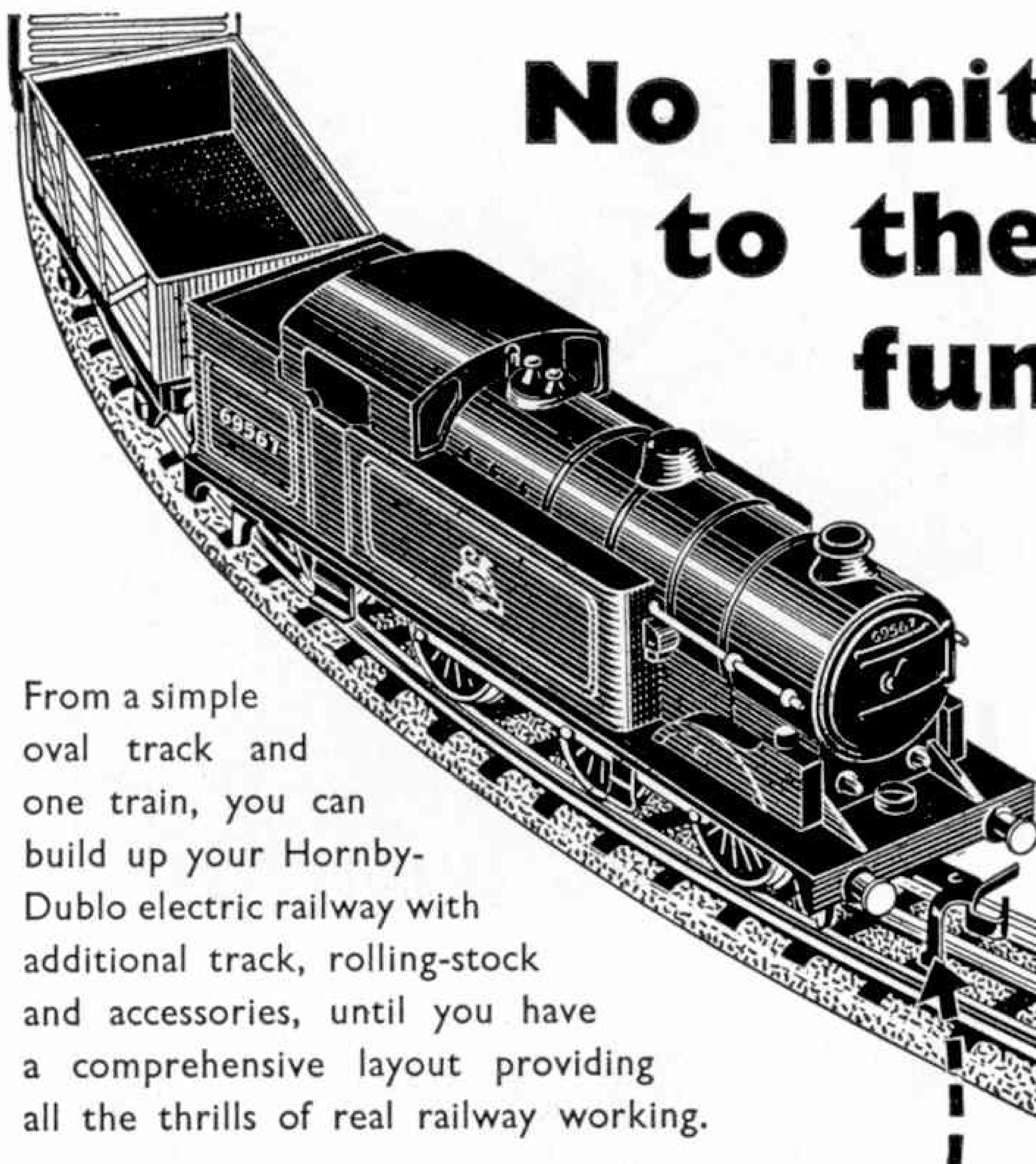
(including Purchase Tax)

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No. 1	Standard Set	21/-
No. 2	Standard Set	33/-
No. 3	Standard Set	54/-
No. 4	Standard Set	104/6
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No. 1X	Converting Set	12/3
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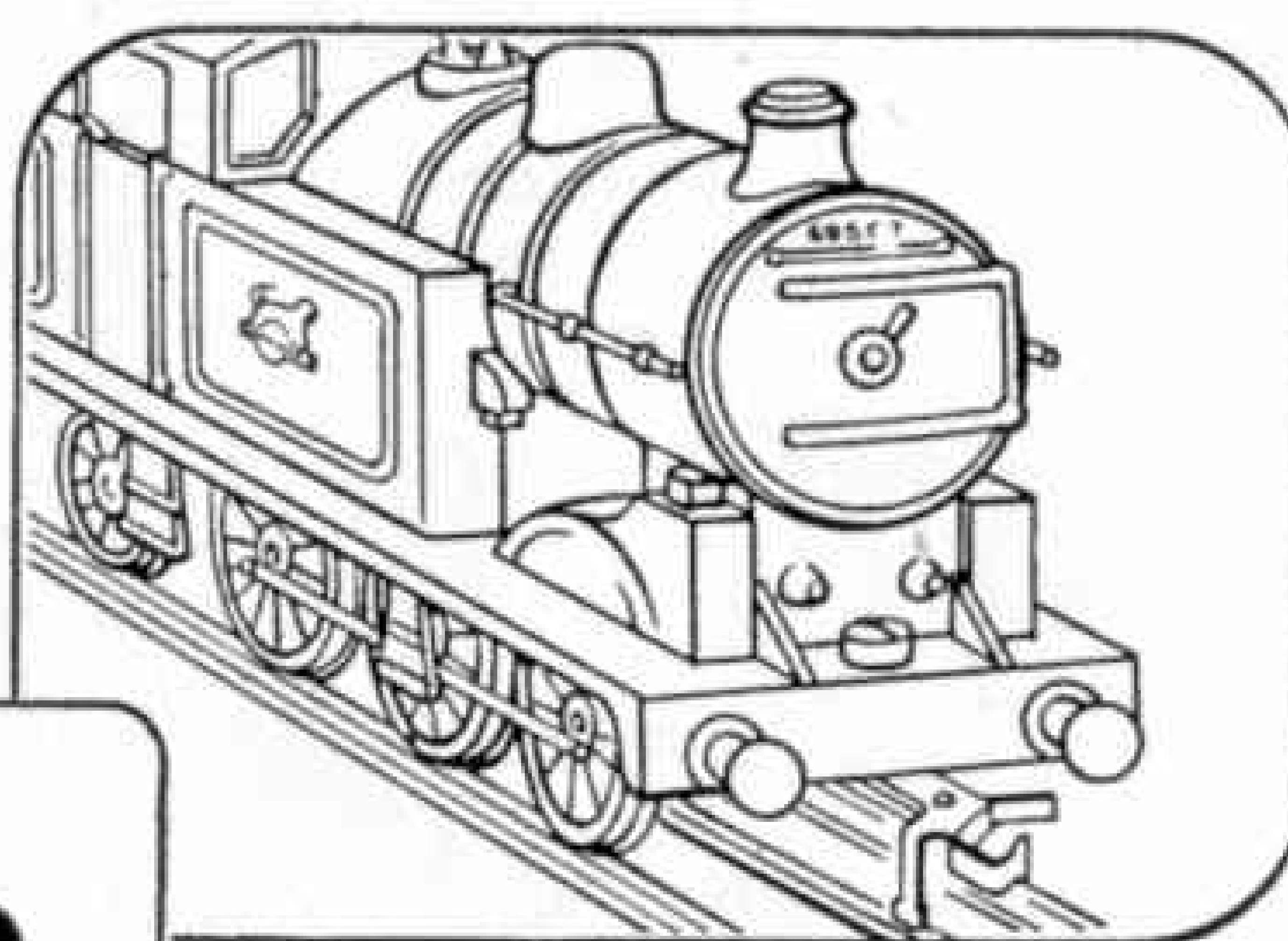
Manufactured by PLIMPTON ENGINEERING CO. LTD., LIVERPOOL 3



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From a simple oval track and one train, you can build up your Hornby-Dublo electric railway with additional track, rolling-stock and accessories, until you have a comprehensive layout providing all the thrills of real railway working.

*This 0-6-2 Tank Locomotive is typical of the class used on British Railways for local train haulage. It is one of the most popular Hornby-Dublo models.*



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# MECCANO

## MAGAZINE

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### It Had Been Done Before!

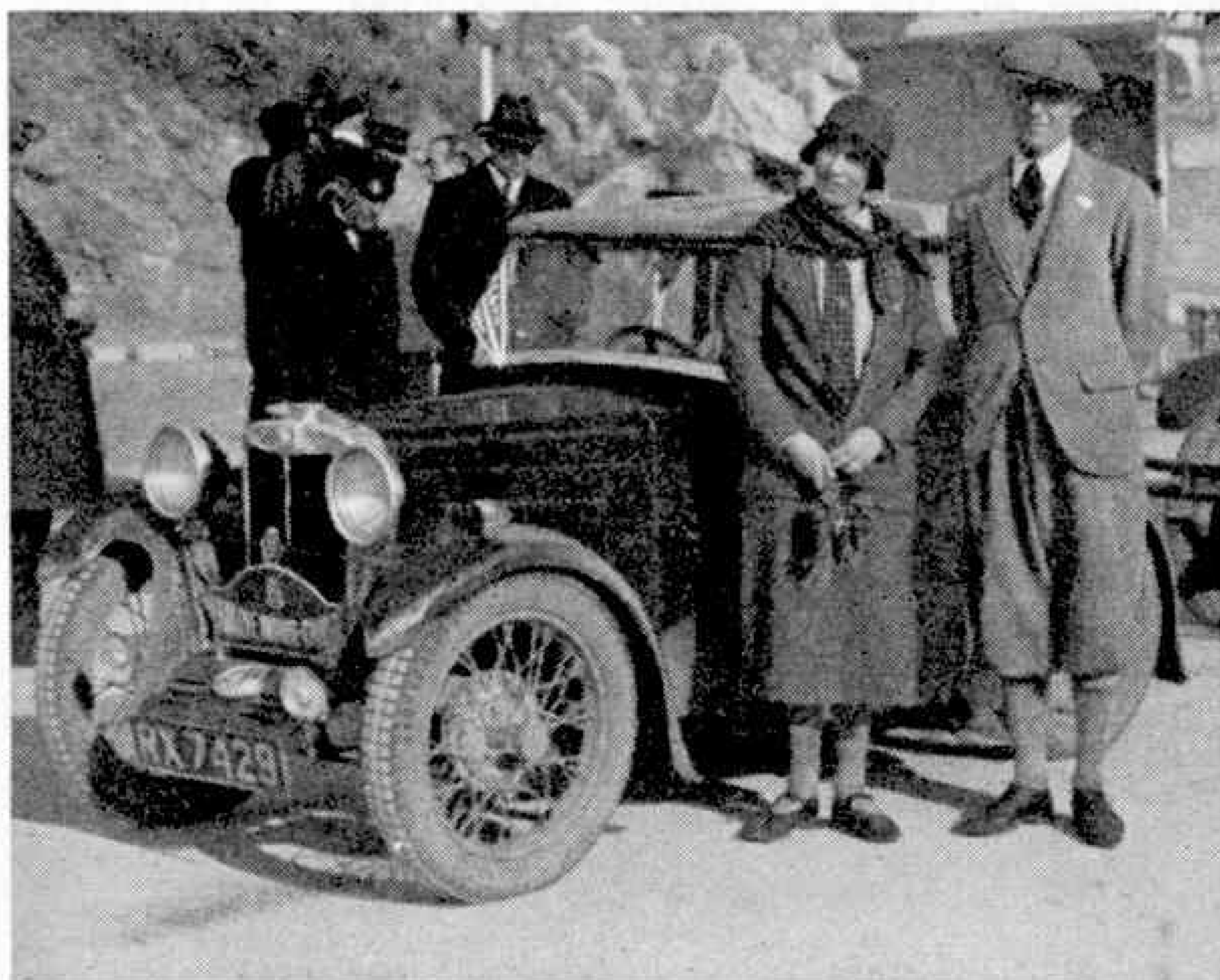
I would like to recall to your minds the Monte Carlo Rally issue of the *M.M.*, that for January last. You will remember that in his article on his Rally experiences in that issue Jack Reece wrote that no British motorist had ever got an 8 h.p. car to Monte on time before he and his cousin Peter Reece did this in 1951. There has been an interesting sequel to this claim, for it appears that after all they had been forestalled.

This I learned from Sir Francis Samuelson, who wrote to tell me that he completed the Monte Carlo Rally on time, after a trouble-free run, in an MG Midget Coupé 20 years before Mr. Reece's first run with a Ford Anglia. He added that the engine of his car was actually of smaller capacity than that of the latter.

Sir Francis started from John O'Groats in the 1931 Rally. "I drove the whole distance without relief myself," he wrote. "I was accompanied by my wife as navigator, but she did not drive. We had a lot of snow in Scotland, and then rain for all the rest of the way, and I had to keep the wind screen wiper going for the entire trip. The sun came out as we approached Monte Carlo, as can be seen by the enclosed photograph of us waiting to check in at the finish."

Here is the photograph to which Sir Francis refers, and I am very glad indeed to have the opportunity of reproducing it and of bringing this fine effort to the

attention of readers. When I told Jack Reece about it he said that he and Peter were both interested and awed. He added



A Monte Carlo Rally picture of 23 years ago. The car is an MG Midget Coupé, in which Sir Francis Samuelson, Bt., and Lady Samuelson completed a trouble-free run in 1931. They are here seen waiting to check in on arrival at Monte Carlo.

however that he was not as surprised as one might think, as he had had the pleasure of competing against him in the 500 c.c. racing world, and knew only too well what a hard and very experienced driver he had often proved himself to be. Every reader of the *M.M.* will join with Jack and Peter Reece, and with myself, in congratulating Sir Francis and Lady Samuelson on their feat of 1931.

*The Editor*

# Westward by Pullman

## Run of the *Devon Belle*

ALTHOUGH the *Devon Belle* has not figured among British express train services for very long—it began to run in 1947—it can at least claim to be one of Britain's famous trains. Like its elder relative, the *Bournemouth Belle*, it is an all-Pullman train, which is still something of a distinction, and it was the first Pullman service to the West Country since the withdrawal of the *Torquay Pullman* on the G.W.R. as long ago as 1930. In addition, it conveys what is still unusual in British main line practice, a rear-end observation car. This rides at the tail of the train on the up journey as well as the down, for the car itself is turned on a turntable at the end of the run, quite a distinction for a coaching vehicle. A further novelty is the public address system, one of the first to be installed as a

on Fridays, Saturdays and Sundays and up journeys on Saturdays, Sundays and Mondays.

As its name suggests, this particular *Belle* of the Southern Region links London and the West Country. Originally the down train consisted of two sections that ran together as far as Exeter. There it was divided, one section going on to Plymouth over the Dartmoor route while the other, bound for Ilfracombe, left the Plymouth line at Coleford Junction. Similar arrangements, but in reverse, applied in the up direction, the two sections of the train being joined at Exeter. Since 1950 the chief destination has been Ilfracombe.

The *Devon Belle* runs from Waterloo, the station where so many holidays start, and is soon on its way past busy Clapham

Junction, then out through Wimbledon, Surbiton, and the outer suburban area to Weybridge, where is Brooklands, once the home of British motor racing. At Woking the Portsmouth line goes off and, to add still further to the number of places on the route beginning with the letter "W," there is Winchfield. It is through Winchfield Station that the train is seen running on our cover, which is from a photograph by Mr. M. W. Earley. Further on comes Worting Junction,

where the Southampton and Bournemouth route diverges, after which there is a fast running stretch to Andover, more climbing and a long descent to Salisbury.

The *Devon Belle* is the only train that passes Salisbury without stopping. At Wilton—still another "W"—a halt is made, but only to change engines. The



A banking engine approaches the rear of the up *Devon Belle* at Exeter St. Davids to assist the train up to Exeter Central. The guard has removed the tail lamp from the observation car, through the windows of which the photograph was obtained.

regular feature on a British train, which enables the Pullman conductor to pass information to the whole train at once.

The *Devon Belle* is a summertime train, which at first ran at weekends only. Various adjustments have been made from time to time in its running arrangements, the most recent calling for down journeys





Salisbury to Exeter road is a hard one, consisting mostly of a series of switch-back grades with plenty of 1 in 100. A long stretch of 1 in 80 for almost six miles constitutes the well-known Honiton bank, and this ends with a tunnel of the same name. But the climbing is not yet ended, for there are further humps to be negotiated before Queen Street Station at Exeter is reached, while a stop is made, too, at Sidmouth Junction.

To reach Exeter St. Davids, where incidentally the westbound trains of the Western Region run in the opposite direction to those westbound of the Southern Region, a steep downward slope of 1 in 37 is negotiated. Needless to say, here the assistance of a banking engine is necessary on the up journey.

After leaving the Plymouth route at Coleford Junction the train soon enters a long stretch where single-line working is the rule. This extends for some 19 miles, but there are of course passing loops at each station. At Umberleigh this comes to an end, but further on from Barnstaple Junction to Barnstaple Town there is another single-line section over the curving viaduct across the wide tidal River Taw. Soon there comes a terrific ascent that finishes with the three miles at 1 in 40 from Heddon Mill up to Mortehoe. This is

followed by an equally fearsome descent to Ilfracombe, ending with two miles at 1 in 36. Naturally, banking engines are required in each direction over this section.

At busy periods the train is very popular and as a result the original 10-car formation is swollen on occasions to a total of 14 cars, well turned out in their brown and

cream Pullman livery. This is a big train, weighing anything up to 575 tons full, but even this does not daunt the Merchant Navy Pacifics of the

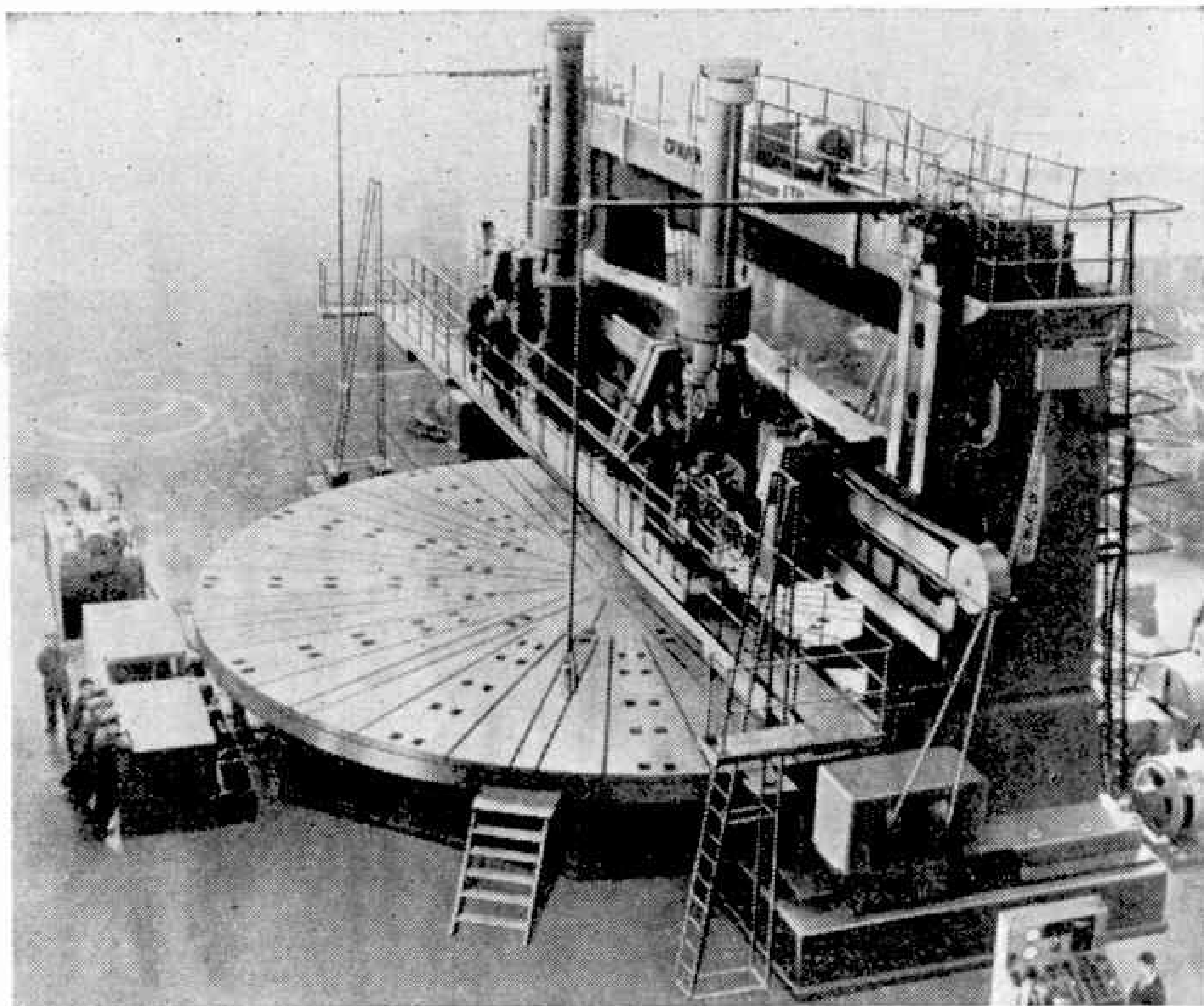
Southern, for they were designed to be able to handle 550-600 ton trains at 70 m.p.h. Whatever criticism may be offered of these engines—and they have aroused a lot of controversy—they can do the job, and they can certainly run. Two of these heavier Pacifics divide the London-Exeter

(Continued on page 206)

Above, a Drummond 4-4-0 brings into Waterloo the empty stock for the Devon Belle with the observation car leading. Below, travellers study the route between Barnstaple and Yeoford through the rear windows of the train. The photographs to this article are by S. C. Townroe.



This vertical boring and turning mill weighs about 650 tons, and is capable of machining workpieces up to 140 tons in weight. The work-table is 41 ft. across. The machine is to be installed in the works of a Canadian company for making heavy hydro-electric plant. Our illustrations are reproduced by courtesy of Craven Brothers (Manchester) Ltd.



IN the field of heavy engineering it becomes necessary from time to time to make machine tools of gigantic size. An example of one of these is illustrated on this page. It is a huge boring and turning mill, and a good idea of its size is revealed at once by a glance at the picture, in which its dimensions can be compared with the heights of the men grouped on and around it.

This immense mill is of the type in which the cross slide carrying the tool boxes moves up and down two fixed columns. The workpiece on which the tools are used is carried on the gigantic round table, which is 41 ft. across, and the mill is of such a size that workpieces up to 42 ft. 6 in. across can be swung between the uprights, while a height up to 13 ft. 4 in. is available beneath the tool boxes.

After looking at the picture and seeing how immense this machine tool is, and with what solidity it has been constructed, the reader will not be surprised to learn that it occupies a floor space measuring 63 ft. by 58 ft. 6 in., and has an overall height of about 40 ft. The weights of the mill itself and of the workpieces it can handle are even more impressive. It weighs about

650 tons and is capable of handling workpieces up to 140 tons in weight.

This wonderful machine tool has been constructed by Craven Bros. (Manchester) Ltd. to the order of the English Electric Co. Ltd. for installation in the new Toronto works of their Canadian associates, Messrs. John Inglis and Co. Ltd. There it will be used in making hydro-electric plant.

Let us look at some of the more remarkable features of this magnificent British production. Take first the table. This is so big that it was made in 13

## A Giant Machine Tool

### 42-ft. Vertical Boring and Turning Mill

separate pieces. There is a central circular portion, which is itself 14 ft. across, and to this 12 separate

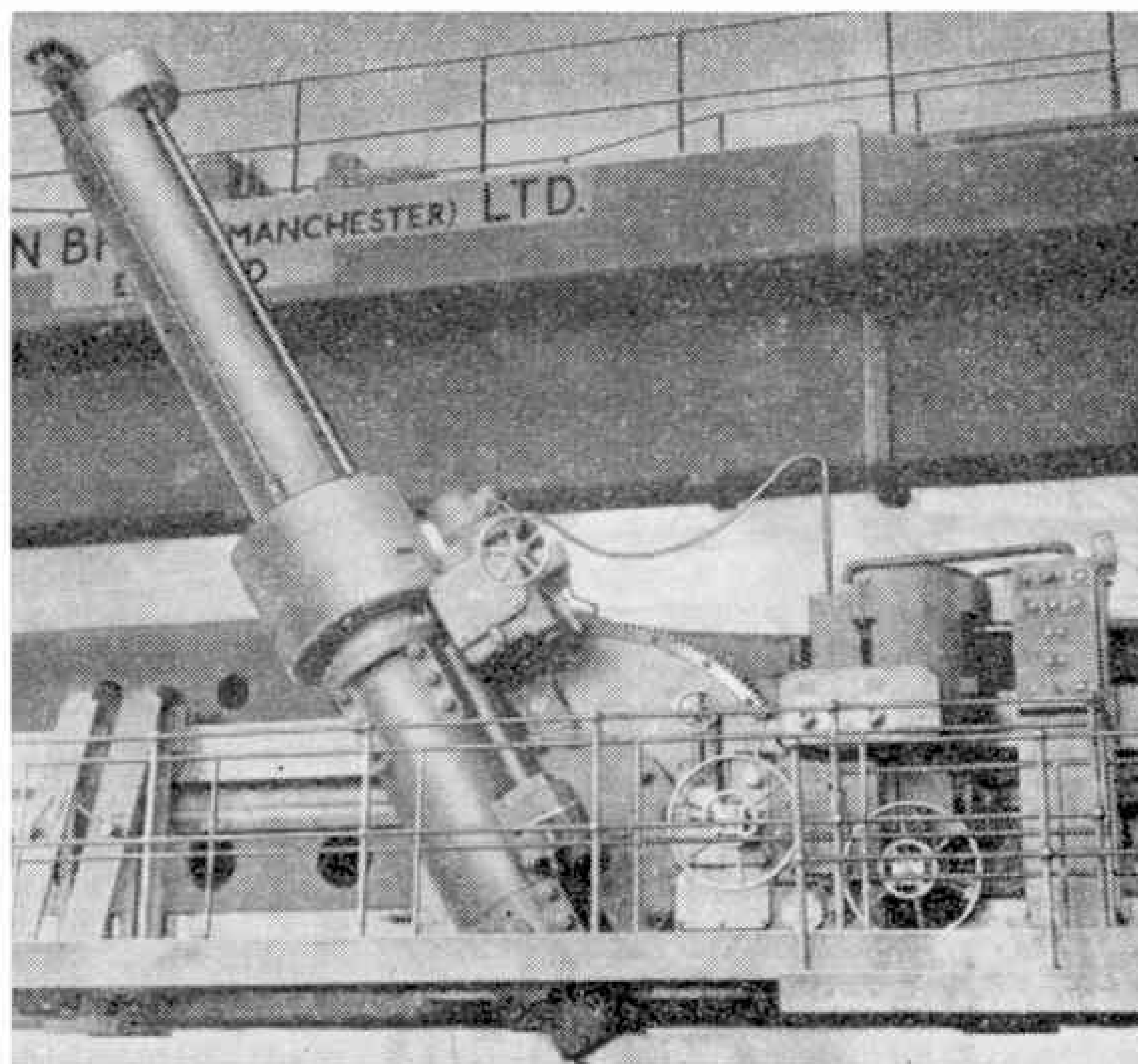
segmental pieces are accurately jointed and keyed to make up the full table diameter. The complete table weighs about 170 tons, and this load, together with that of the workpieces it carries when in use, is supported by three concentric circular tracks mounted on top of the bed that supports the whole of the mill. For central location the table has a spindle of conical form, 4 ft. 6 in. in diameter, which rotates in bronze bearings. The bed that carries the huge mass of the machine tool and its workpieces is itself built up of eight sections,



One of the two ram saddles that carry the tools used for boring and turning. They can be set at any angle up to 30 degrees on either side of the vertical position.

When the machine tool is at work the total rotating mass may be about 300 tons. This means that the greatest care must be taken to provide efficient lubrication. The spindle and three table tracks run in oil baths formed by their bearing housings and in addition there is pressure oil feed direct to all the various bearing faces. Two sets of oil pumps, driven by separate 5 h.p. motors, supply the oil. One of these is generally in use and the other is held in reserve, to be brought into action in emergency or when dealing with heavy loads.

There are elaborate provisions for making sure that the lubrication is thorough and complete. The main motor driving the table cannot even be started if the full quantity of oil required is not flowing, and if the oil flow diminishes or fails, an indication light on the main control deck is extinguished and the machine is automatically stopped. In addition, an alarm bell rings and two warning lights on the desk are illuminated if any bearing temperature rises above what it should be for correct operation. These temperatures are registered on a dial in the main control desk seen in the lower right-hand corner of the illustration of the mill.

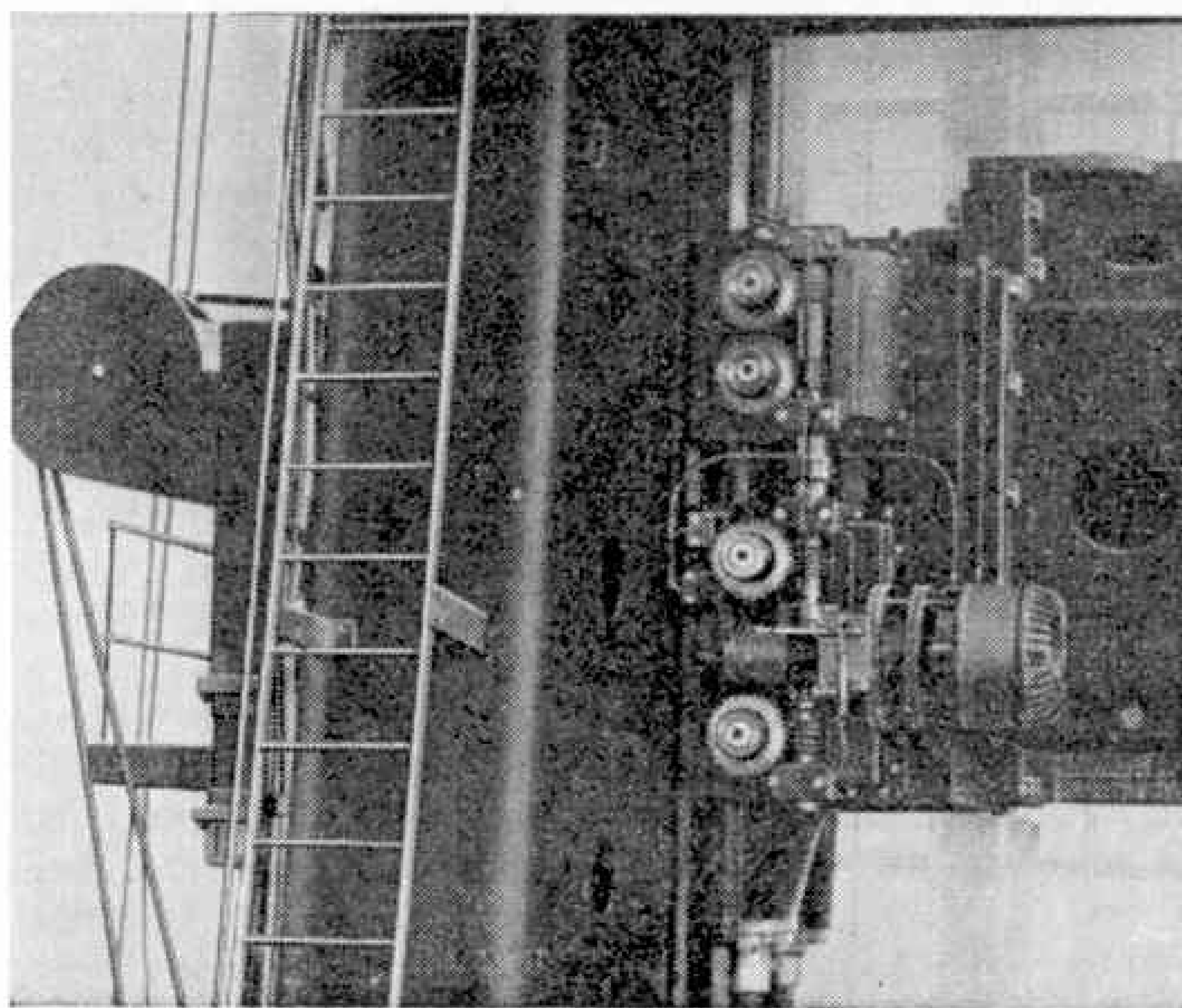


The table is driven by two 150 h.p. motors, which are electrically connected so that they share the total load equally. Through gears they drive pinions that mesh with a gear ring on the table. Normally the table rotates continuously, but the electrical equipment is so designed that when required partial rotation and reversal can take place. This allows the machining of intermittent or local surfaces in the manner of a planing machine.

The cross slide, which carries the tools to work on the workpieces carried on the table, is comparable almost to the bridge of a ship in size. It is 56 ft. long and weighs about 72 tons. Electric motors raise or lower it at a speed of about a foot a minute when required, and an electrically-operated mechanism locks it to the uprights when it is in its correct working position.

There are two tool saddles on the cross slide, each of which has a hexagon ram fitted with a three-position tool box. The rams can be set at any angle up to 30 deg. on either side of the vertical position. Each saddle is complete with its own 5 h.p. variable speed traverse motor and feed gear-box, for moving it horizontally along the cross slide and for vertical movement of the

(Continued on page 206)



The cross slide carrying the saddles is locked to the uprights when in the required position by an electrically-operated mechanism.

# A Scottish Clock Restored

## Why the Bells Ring Out Again at Paisley

By W. K. Lewis, B.Sc., M.I.C.E.

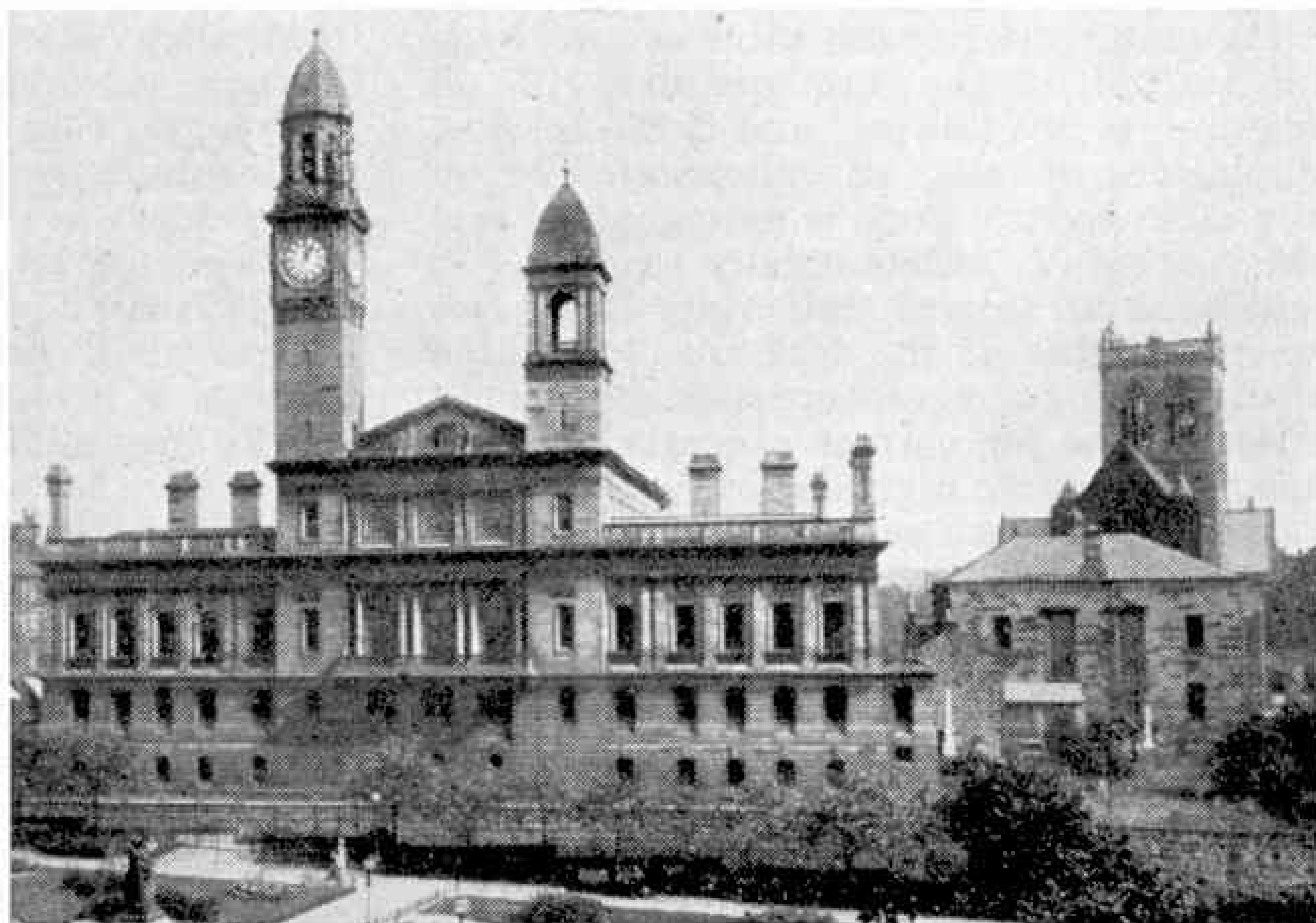
THIS story would never have been written if the *Meccano Magazine* for December 1949 had not included an illustrated article on the Great Clock of Bradford. At that time, I was Deputy Engineer to Paisley Corporation, and the department's multifarious duties included responsibility for all the public clocks throughout the town.

The principal clock, situated in the north-west tower of the Town Hall, was requiring overhaul and its carillon of ten bells had been silent for nearly ten years. Since 1882 the clock had faithfully served the Paisley "Buddies," as they are affectionately called, and until the outbreak of the War its delightful chimes and selections of tunes had echoed across to the ancient Place of Paisley and the beautifully restored Abbey, which was founded in 1163.

Following the war years, several authorities had been consulted and various attempts had been made to interest clockmakers, but these efforts had failed to find anyone interested enough to overhaul both clock and carillon, and to report on the possibilities of converting it to a modern system of electrical winding. After some research, a press report of the inauguration of the clock established the fact that it had been made in 1880 by a firm named Messrs. Gillett and Bland, but no trace of that firm was known locally. The clock had been presented to the town by Mr. Stewart Clark, of the Anchor Mills, Paisley, and formed part of the munificent gift now known as the Clark Town Hall. The records of that firm gave no assistance on the origin of the clock, and it looked as if the work of overhaul and repair would have to be given to someone with little interest in the clock. This was the last thing I wished to

do, for I knew the clock mechanism had been fashioned by craftsmen and that the hand-cut gears and striking mechanism could best be dealt with by the makers or their successors.

When I read the article on the Great Clock of Bradford I was struck by the similarity of its mechanism to that of the Paisley Clock. A glance at a picture of the winding side of the timepiece showed the name Gillett and Johnston, Croydon. Could there be any connection with the clock at Paisley? Soon a letter was despatched to Croydon, and back came the glad news. It was indeed the same firm, now under a new name, and they were delighted to be asked to report on the clock that had served Paisley so well.



Clark Town Hall, Paisley, in the tower of which is the clock restored as explained in the accompanying article.

The time is indicated on four skeleton iron dials with opal glazing, each 9 ft. 8½ in. in diameter, and the original clock mechanism was driven by weights of about 14 cwt. that had a vertical travel of nearly 70 feet down the tower. These had to be wound laboriously by hand. The compensated pendulum of zinc and iron tubes carried a cast-iron cylindrical bob weighing 2½ cwt. When the clock was first installed, several novel features were introduced, including a self-acting gas



apparatus operated by the clock to turn on and off the gas lighting automatically and to vary the time of doing so in accordance with the seasons. This was later superseded by electric lighting.

The timekeeping of the clock was always good, but an electric telegraph system was installed to connect the Paisley Observatory with the clock tower, so that the attendant could check the clock time daily with the master clock at the Observatory. There was no wireless time signal in those days and Greenwich Mean Time in Paisley was ascertained locally!

The original carillon playing machine was also weight driven, and the six large barrels provided a selection of 35 tunes and a ringers' peal for joyous occasions! Five of the barrels had each seven tunes, one for each day of the week, including an appropriate psalm or hymn tune for Sundays, and the clock mechanism automatically altered the daily tune to be played. A keyboard was also provided by which the bells could be struck by hand, but this part of the original equipment had been removed at some later date. The bells were struck by hammers on the outside, and in order to provide rapid manipulation a system of double hammers was fitted. The hour bell, the largest of the complete set of ten, weighed more than  $19\frac{1}{2}$  cwt.

In order to eliminate daily winding of the clock, the bevel gear drive to the four faces had been dismantled a short time before the outbreak of war and independent synchronous motors fitted to each dial. This system had several disadvantages and in the exposed site with its prevailing westerly winds, it was no unusual thing for the faces to indicate different times, thus necessitating frequent adjustments. Moreover, the arrangement made no

provision for striking the hours and in consequence when the civic fathers again required the clock to strike the hours, an attendant had still to climb the tower daily and wind the original clock mechanism, which then operated the quarter hour and hour striking gear.

The bells remained silent throughout the whole of the war period, but at the cessation of hostilities it was decided that the carillon should be restored. Electricity

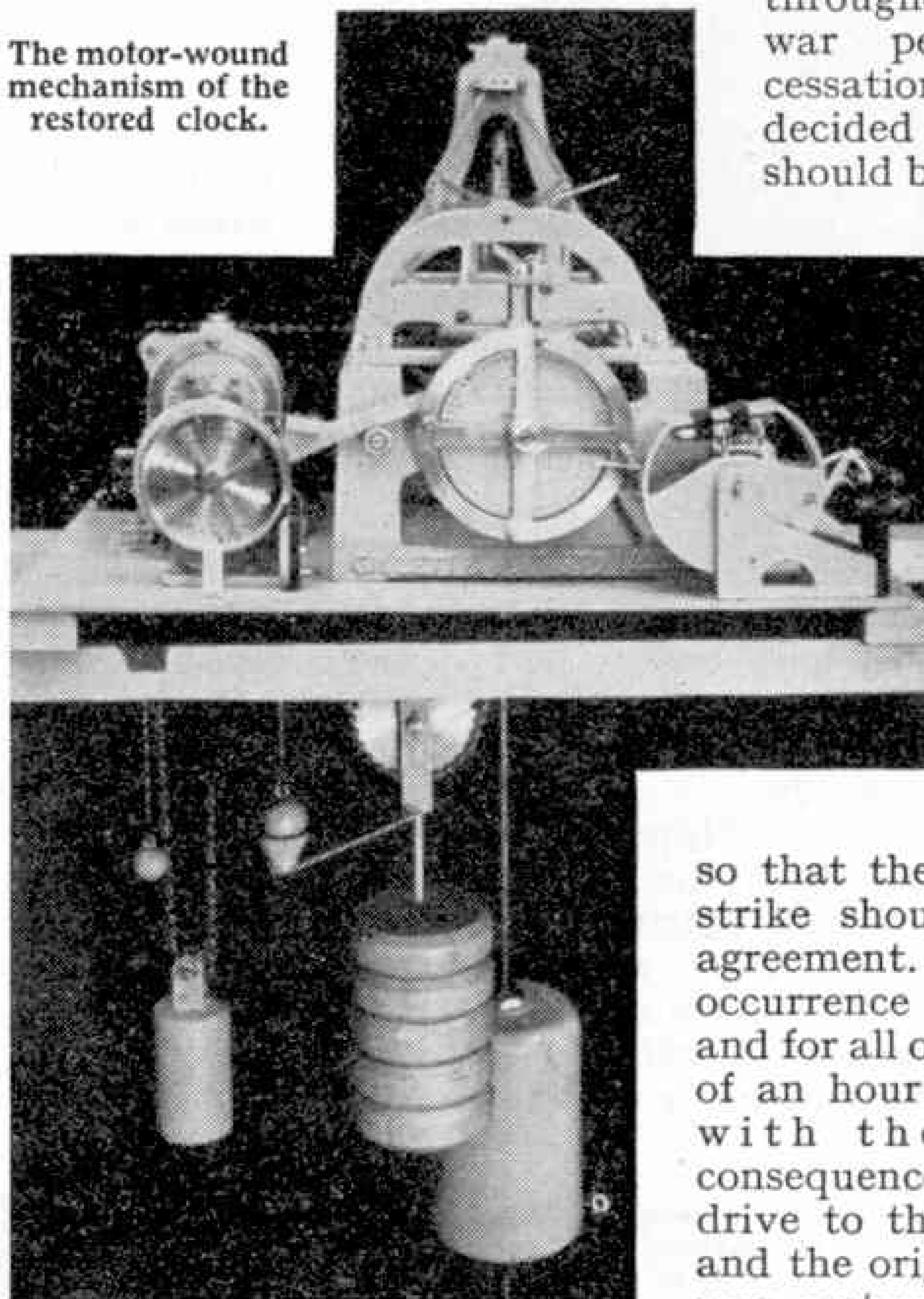
load shedding had by then made the time keeping characteristics of the electrically-driven dials so erratic that no reliance could be placed on the timing, and it was necessary for attendance to be provided several times daily to make adjustments

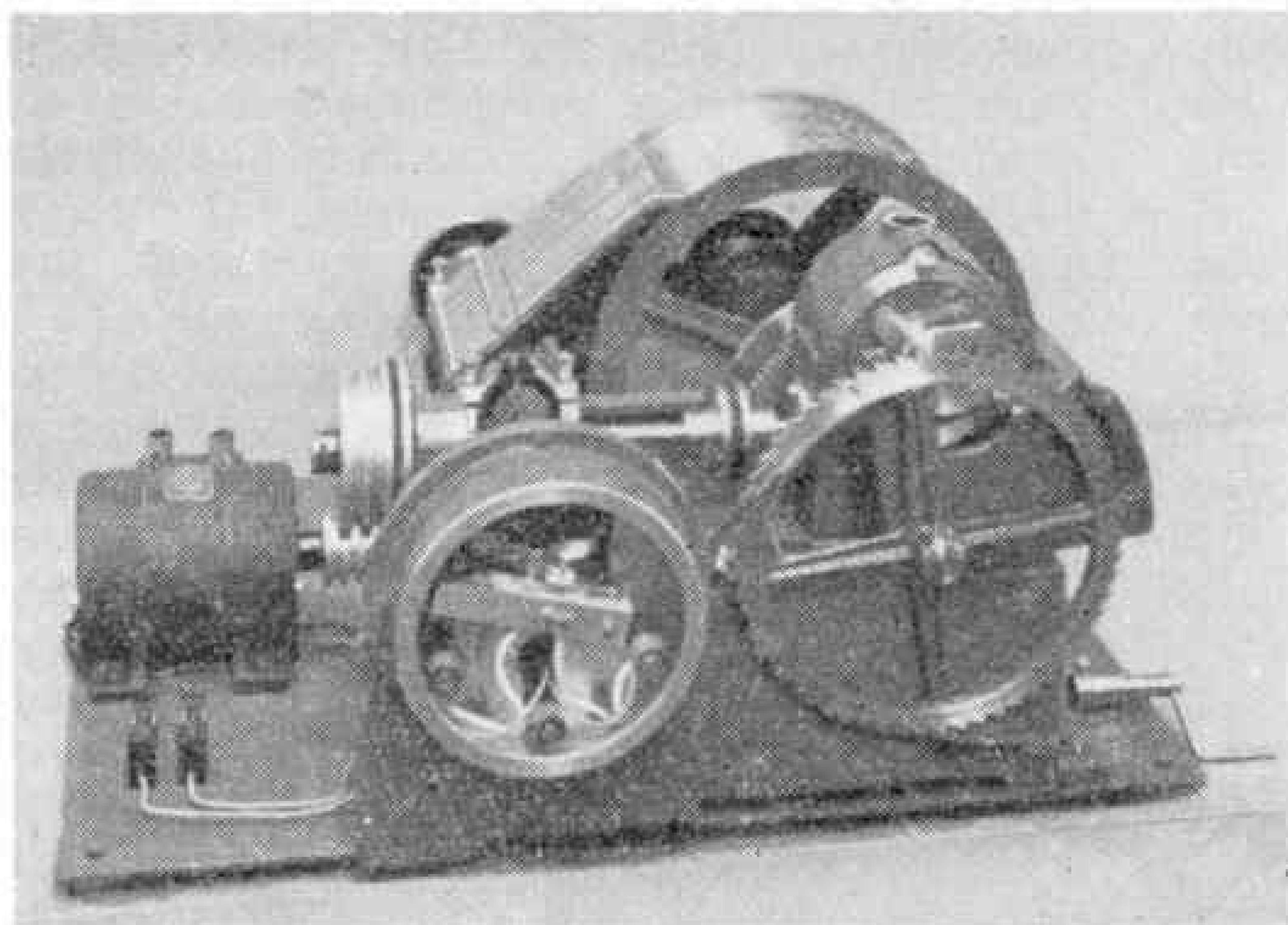
so that the clock faces and the strike should be reasonably in agreement. It was a common occurrence for the dials to differ, and for all of them to be a quarter of an hour or more out of step with the hour bell! In consequence of this the motor drive to the dials was scrapped and the original bevel gear drive was restored, operated by the weight-driven clock.

This was the state of affairs when the firm of Gillett and Johnston Ltd. were asked to report. The clock was found to be in fair condition, despite its 70 years of age, but in view of the fact that the carillon playing machine was declared obsolete, the alternative offer to install a new clock mechanism and carillon playing machine was preferred and the expenditure authorised by the Town Council early in 1950.

The new clock mechanism is wound by electric motor, and is fitted with a compensated pendulum and Grimthorpe Gravity escapement similar to that on the clock for "Big Ben". In operation the timepiece is weight driven, and automatically rewound by a fractional horse power motor approximately every hour. If the electricity supply were to fail the weights would continue to drive the clock for a further three hours and

The motor-wound mechanism of the restored clock.





This is the machine that plays tunes on the bells of the carillon of the Paisley Town Hall clock.

rewinding would follow immediately current again became available. The frame is of cast iron with bushes of hard bronze and ball race bearings on the winding gear ensure minimum wear, freedom of movement and maximum life.

The Hour and Quarter Chimes are operated by independent motor driven units also fitted with ball race bearings and actuated by a mercury tube on the timepiece. After the correct number of blows have been struck, the current is automatically switched off by a similar mercury tube on the striking unit. The new carillon playing machine is of the electric pneumatic type, operating double hammers that strike the inside of the bells. This method ensures a purer tone and gives more volume than the older method of striking the bells by gravity hammers on the outside.

Each hammer is operated by a pneumatic cylinder and piston and on each cylinder there is an electric magnet that is energised when contact is made, either by the tune playing machine or when a key on the keyboard is depressed. This opens a ball valve and allows compressed air to enter the cylinder and force the piston down, carrying the hammer forcibly against the bell. Air is supplied from a motor driven compressor at a pressure of approximately 50 lb. per sq. in., and the

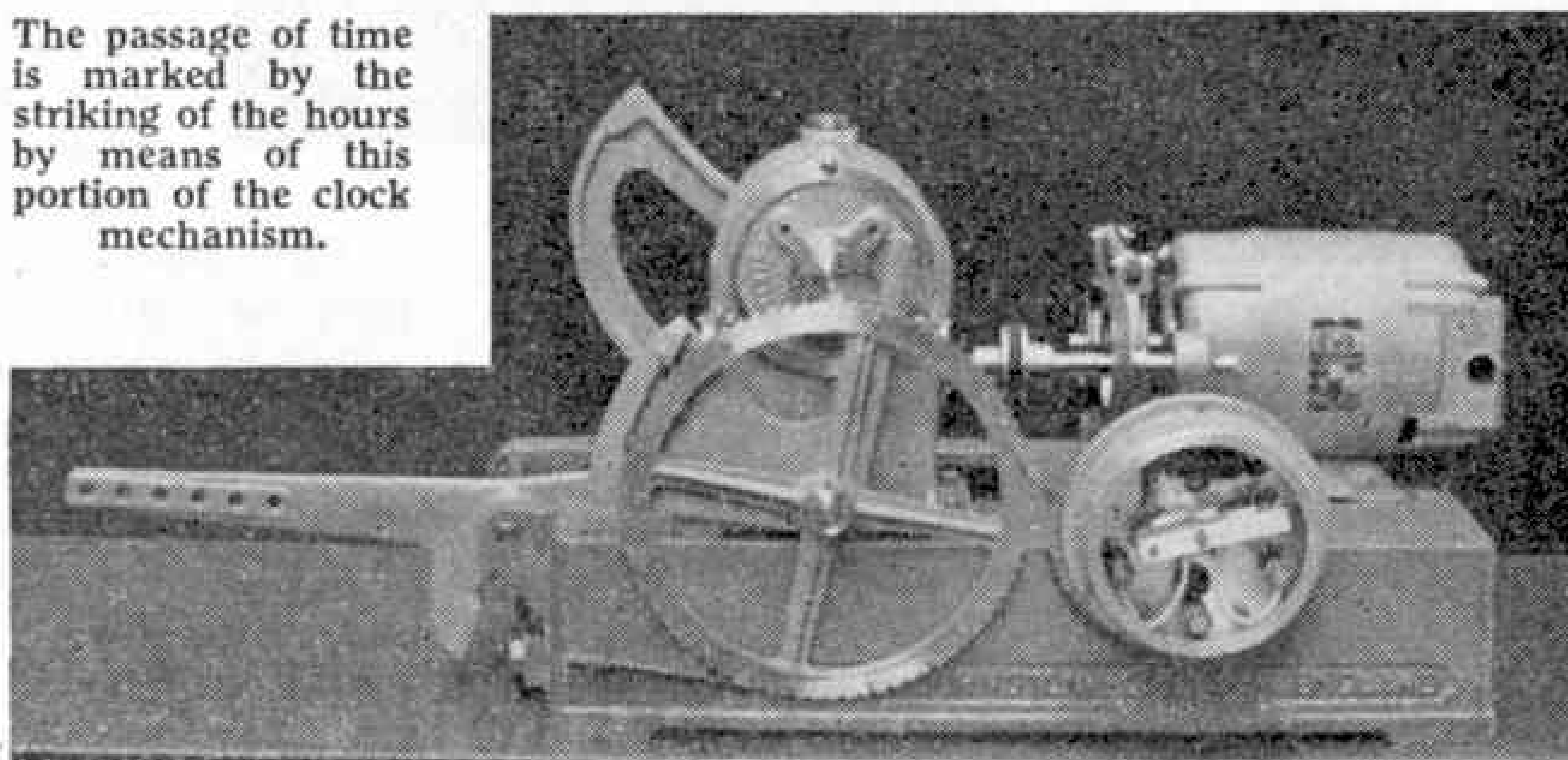
motor is automatically started by a mercury switch released by the timepiece. An isolating switch at the keyboard enables the tune playing machine to be cut out and the compressor started when hand playing is to be used.

The tune playing machine and keyboard are mounted in an attractive wall cabinet in the switch room adjoining the stage in the large hall. It is no longer necessary for the attendant to climb the clock tower to wind the clock or change the tune barrels, and the keyboard makes it even possible to use the bells as a real "off stage" effect or in company with an orchestra. The tune barrels are machined from bronze castings and provided with grooves for adjustable bronze pegs.

By moving these along the grooves, it is possible to set them to play any tune within the compass of the 10 bells, and the whole barrel can be removed and replaced by another in a matter of seconds.

The complete installation including overhaul and regilding the four clock dials and hands was completed by the end of 1950 and the author experienced one of the thrills of his life when he inaugurated the carillon by playing in the first 15 minutes of the New Year on 1st January 1951 on the newly installed keyboard. That brief

The passage of time is marked by the striking of the hours by means of this portion of the clock mechanism.



recital, which included some of the well loved Scots Psalm tunes, among them *Crimond*, was more than recompense for all the earlier worries in carrying out a job far removed from the normal work of a Civil Engineer! It seemed hardly possible that only a year had elapsed since the publication of the article in the *Meccano Magazine* that had renewed the link between Bradford and Paisley through Croydon after 70 years, and made the Paisley bells ring joyously again.



# More About the Foudroyant

By the Editor

MR. DAVID GUNSTON'S article on the *Foudroyant* in the March 1953 *M.M.* aroused much interest, and brought so many enquiries for berths, that a few more words about this famous wooden-wall—the last of the sailing frigates of the Royal Navy—may be of value to readers.

The keel of the *Trincomalee*, as the vessel was originally named, was laid in April 1816 and a month later the Parsi builders assembled with the Governor of

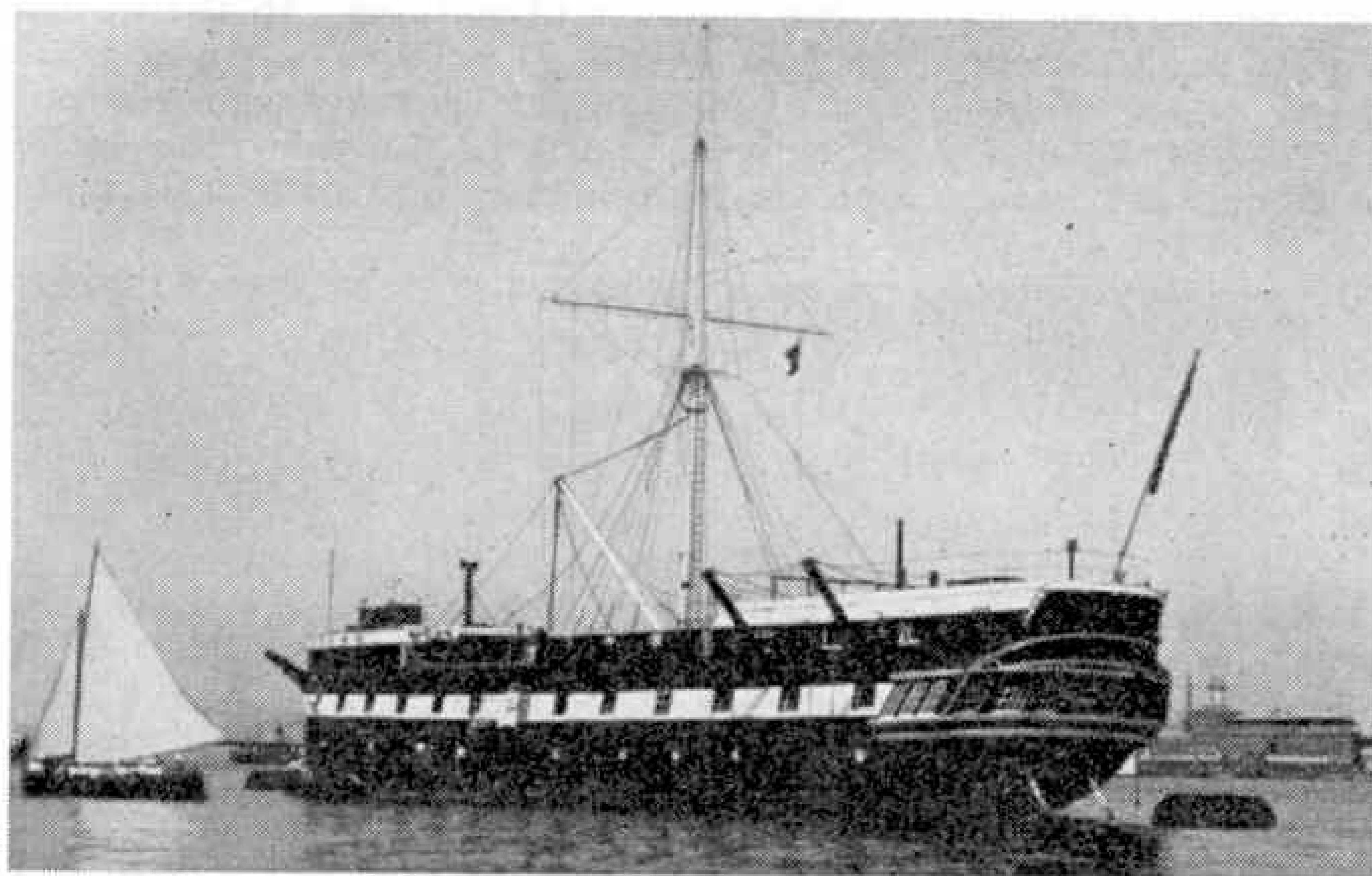
guns. She continued thus for the remaining 63 years of her active service, after which Mr. Wheatly Cobb, in his turn, found the poop too restricted for his purposes and constructed one that gave him more cabin space. This was an anachronism for a frigate of 1835, and the reconstruction of the Symonds stern has lately been completed under the direction of Lt. Col. Harold Wyllie, the greatest living expert on the construction and rigging of wooden

ships. The illustration in the March 1953 *M.M.* showed the Cobb stern and here is one of the ship after reconstruction.

"The key to a nation's future," says Mr. Arthur Bryant, "is in her past. A nation that loses it has no future." Where, in terms of the sea, can there be a happier marriage of past and future than in the only surviving sailing frigate of the Royal Navy, moored at the entrance to Britain's first naval port amid the bustle of modern naval development?

Those who are fortunate enough to spend a period in her can enjoy sailing, pulling and swimming, learn knots and bends and how to work out compass courses. They also pay visits to the *Victory* and probably the latest submarine or aircraft-carrier! There is strict discipline, of course, but everybody is happy and comfortable, and all return from this fine holiday training course delighted with the experience and with what they have learned. The *Foudroyant* still retains the figurehead that distinguished her when she was launched as the *Trincomalee* at Bombay, 137 years ago. It is a striking representation of an Indian prince, with a dark countenance, in flowing robes and a turban.

Bookings are well under way for the 1954 training season, but there are still vacant berths. Those who are interested should not write to me about them, but send enquiries to The Superintendent, T.S. *Foudroyant*, Gosport.



The *Foudroyant* at Portsmouth, where she provides holiday training for boys and girls.

Bombay and other people of eminence to witness the ancient Zoroastrian ceremony of the Silver Nail, the purpose of which was to ensure that her timbers would endure for many years. The stem was set up and a single hole was bored through it to receive a nail of that clean and precious metal—silver. A lady chosen for her youth and beauty drove the nail home, after which the High Priest of the Parsi blessed the ship and offered prayers for her future. The Governor then presented a shawl to the builder—Jamsetjee Bomanjee, the most famous of all Parsi master shipbuilders—and rose water was sprinkled over her timbers.

In course of time developments in armaments, particularly gunnery, meant that Jamsetjee's square stern imposed undesirable restrictions in action, and in 1835 Sir W. Symonds constructed an elliptical stern by which a better arc of fire could be obtained with the stern chase

# Scientific Glassware

## How Flasks, Beakers and Tubing are Made

By E. M. Patterson, M.Sc., A.R.I.C.

**D**URING the 18th and 19th centuries, with the rapid expansion of chemistry as a science, glass was an important and indeed indispensable material for the laboratory worker. The glass retort and bottles of the mediæval alchemist continued in use and they were joined by an ever extending artillery of test-tubes, beakers and flasks of all shapes and sizes, basins, condensers and extractors.

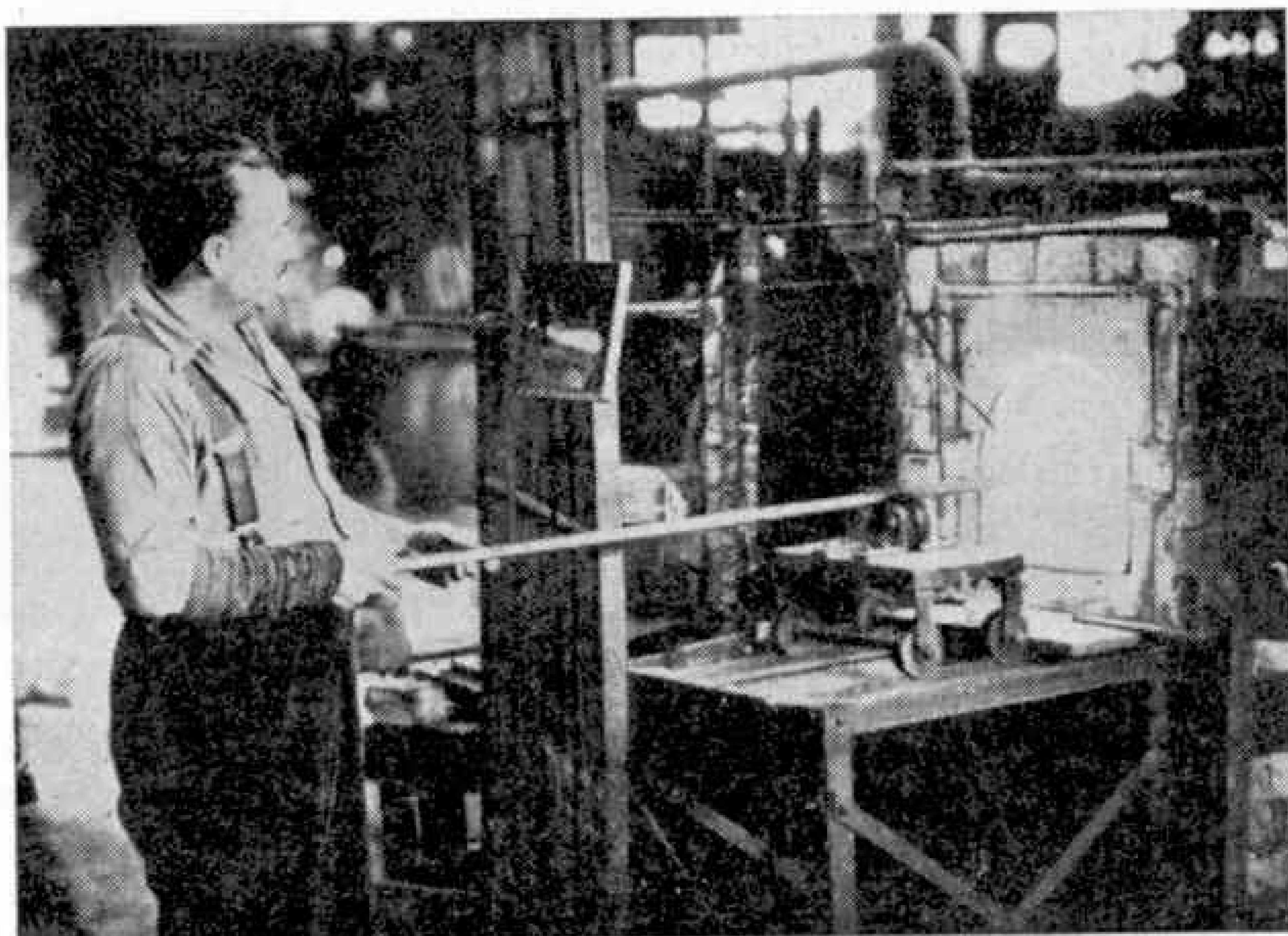
Glass used in making these articles came from the silica of pure sand, fused with varying amounts of soda, lime, magnesia and alumina. It had several disadvantages. For one thing, the soda tended to dissolve out on prolonged contact with hot water and more easily still in caustic solutions, and a second disadvantage was the tendency of the glass to crack on rapid heating or cooling.

In the mid-19th century, Michael Faraday experimented with glasses containing the oxide of boron, but this type of glass does not seem to have been commercially exploited until 1915, when the Corning Glass Company, in the United States, brought out a new glass of this kind, which they called "Pyrex". It is no exaggeration to say that these borosilicate glasses, now made under a wide variety of trade names, have revolutionised laboratory techniques. They have roughly a third of the expansion of soda-lime glass, giving a much better resistance to thermal shock, and much improved chemical stability over the earliest types. Their properties indeed have brought them into household use as oven glassware, engineering trades make use of them in pipelines and in electrical insulators, and the large mirrors of reflecting telescopes owe their existence to their unique properties.

Much scientific glassware is still produced individually by craftsmen. The raw materials, high purity silica sand, together

with the correct amounts of borax and the other finely powdered constituents, are weighed out, intimately mixed and charged into the furnace. They are generally accompanied by a proportion of "cullet," that is, waste glass of similar composition from earlier melts.

The melt is made either in pot or tank furnaces, heated by producer gas or oil fuel. These two kinds of furnaces differ in the methods of working. In the former batches weighing perhaps half a ton are melted in individual fireclay pots grouped in a beehive-shaped furnace; the latter operate continuously and have a capacity



Reheating a gather of glass in a gas furnace. The operator watches through a blue glass screen to protect his eyes from the intense radiation.

of many tons.

Tank furnaces are obviously well adapted for routine mechanised production. In both cases the quality of the firebricks used to contain the melted glass is highly important since the operating temperature may be as high as 1 600°C. which is a true white heat, and in contact with the melt slight corrosion of the container is almost inevitable. If severe this will affect the composition of the glass itself.

The initial melting of a batch produces a viscous fluid, glowing light yellow, but still full of small incompletely fused fragments and bubbles of the gas carbon dioxide.





Members of a team, using crowbars and a trolley, move a large glass pot within the furnace. They work speedily to avoid being overcome by the heat.

Further heating is required, often assisted by the addition of small amounts of volatile oxides of arsenic or antimony, before a uniform melt is obtained free from undesirable "cords," as internal streaks of slightly varying composition and refractive index are called. The very viscous nature of the melt, the necessity to avoid introducing further air bubbles, and the very high temperatures make it impossible to use mechanical stirring to achieve uniformity, and the process cannot be hurried.

Whatever type of furnace is used, access to the molten glass is via a working hole, a foot or so across, normally covered by a fireclay slab. The workman approaches and lifts away the slab. Standing what seems to be uncomfortably close to the glowing aperture, his eyes protected by dark glasses, he then makes a "gather" on the end of the "iron" or blowpipe, deftly rotating it and removing it from the melt once enough has become attached. The hot gather, a yellow-hot globe, is worked by rolling it to and fro on a polished iron plate shaping it with a charred wooden paddle and blowing to maintain a central cavity. Successive gathers may be added

from the melt and the constantly cooling mass on the iron is reheated in a small gas-fired furnace to keep it at a workable softness.

In the production of glass tubing, accurately gauged blowing of several gathers has given a hollow egg-shaped gob of plastic glass, perhaps 25 lb. in weight on the end of the iron. It is reheated to about 1,100°C. while an assistant is producing a smaller saucer-shaped gather on a solid iron rod or "punty". The gathers on the punty and iron are brought face-to-face, they adhere, and the drawing process begins.

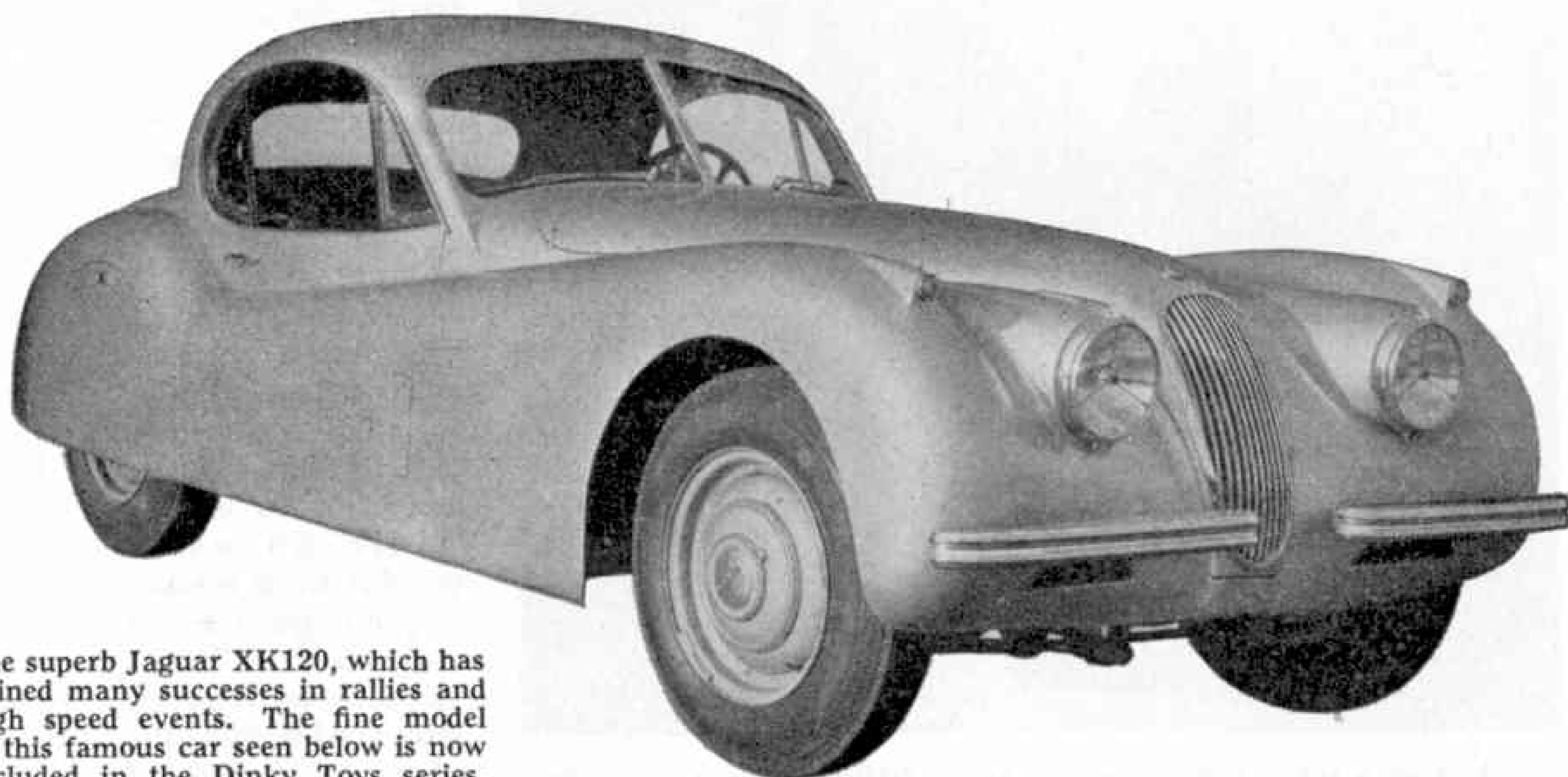
This involves four men. One retreats with the punty; another manipulates the iron with its yellow, glowing load of glass; a third blows into the open end of the iron to maintain a slight internal pressure; and a fourth rapidly checks the diameter of the central part of the drawn tube with a gauge. This fourth man communicates the progress of the draw to the rest of the team by means of a pair of wooden clappers, the sound of which is heard above the hiss and roar of gas flames. Meanwhile the tube has



A large gather of glass, weighing about 25 lb., being reheated in readiness for attaching to the punty and drawing out into a 100 ft. length of heavy gauge tubing.

become almost hard and when the draw is completed, the hundred-foot length of dull-red-hot glass is laid in a metal trough. The tapering extremities, still attached to blowpipe and

(Continued on page 206)



The superb Jaguar XK120, which has gained many successes in rallies and high speed events. The fine model of this famous car seen below is now included in the Dinky Toys series.

## DINKY NEWS

By **THE TOYMAN**

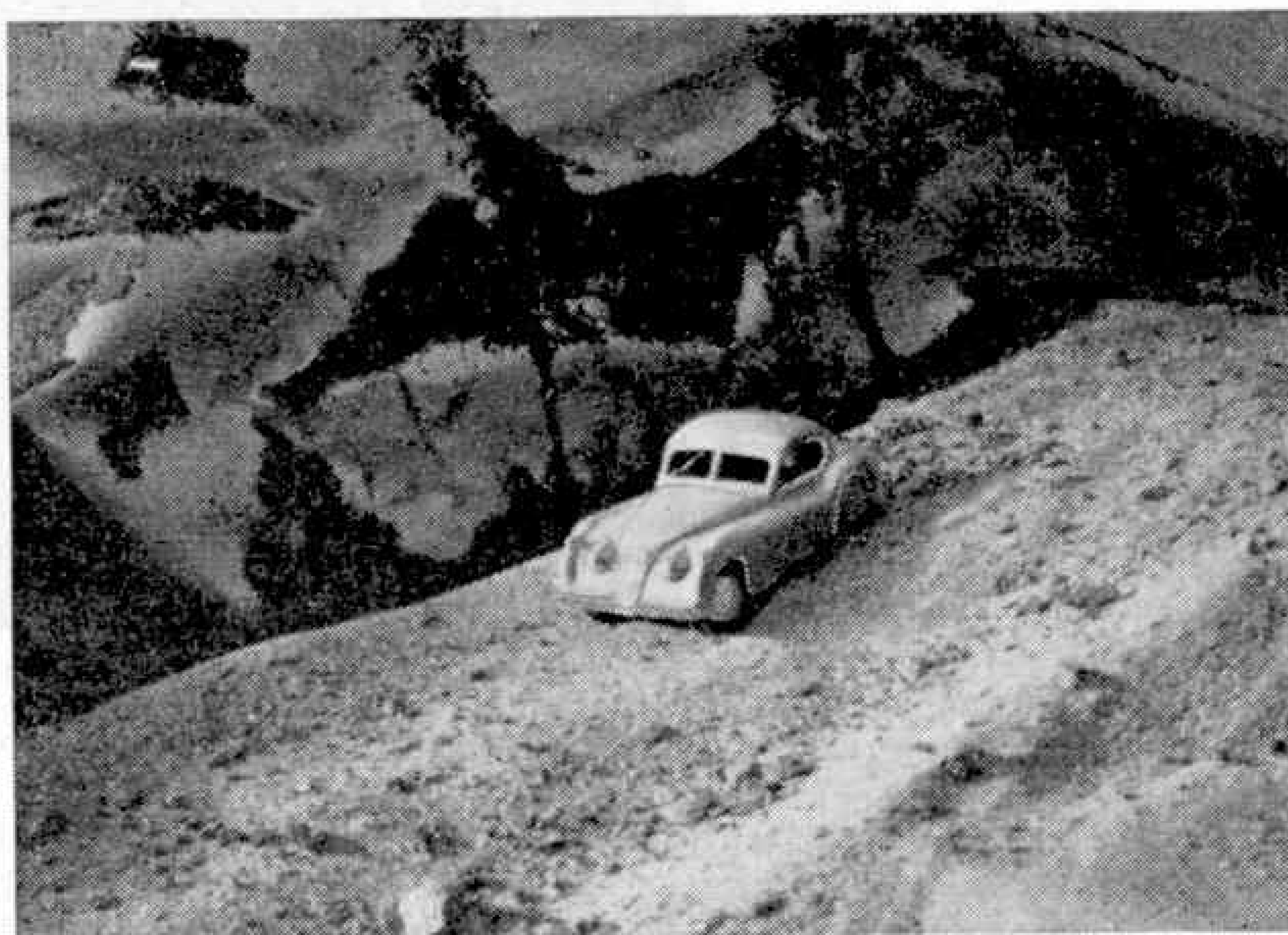
## New Models Again!

**A**FTER a few blank months, the reason for which I explained in January, March saw the addition of two new models. When you saw these in last month's *M.M.* I am sure you would think them well worth waiting for.

The first of the new models is one that has been asked for repeatedly ever since I first hinted at its introduction last August, the Jaguar XK120 Coupé. This model of the famous car that has been so successful in rallies and high-speed events all over the world is a "must" for every collector. A picture of the real XK120 appears at the top of this page, and comparison with the photograph below shows that the Dinky Toys model has captured to the full the beautifully streamlined shape and vivid impression of speed given by the actual car. The miniature is delightfully proportioned and a joy to handle.

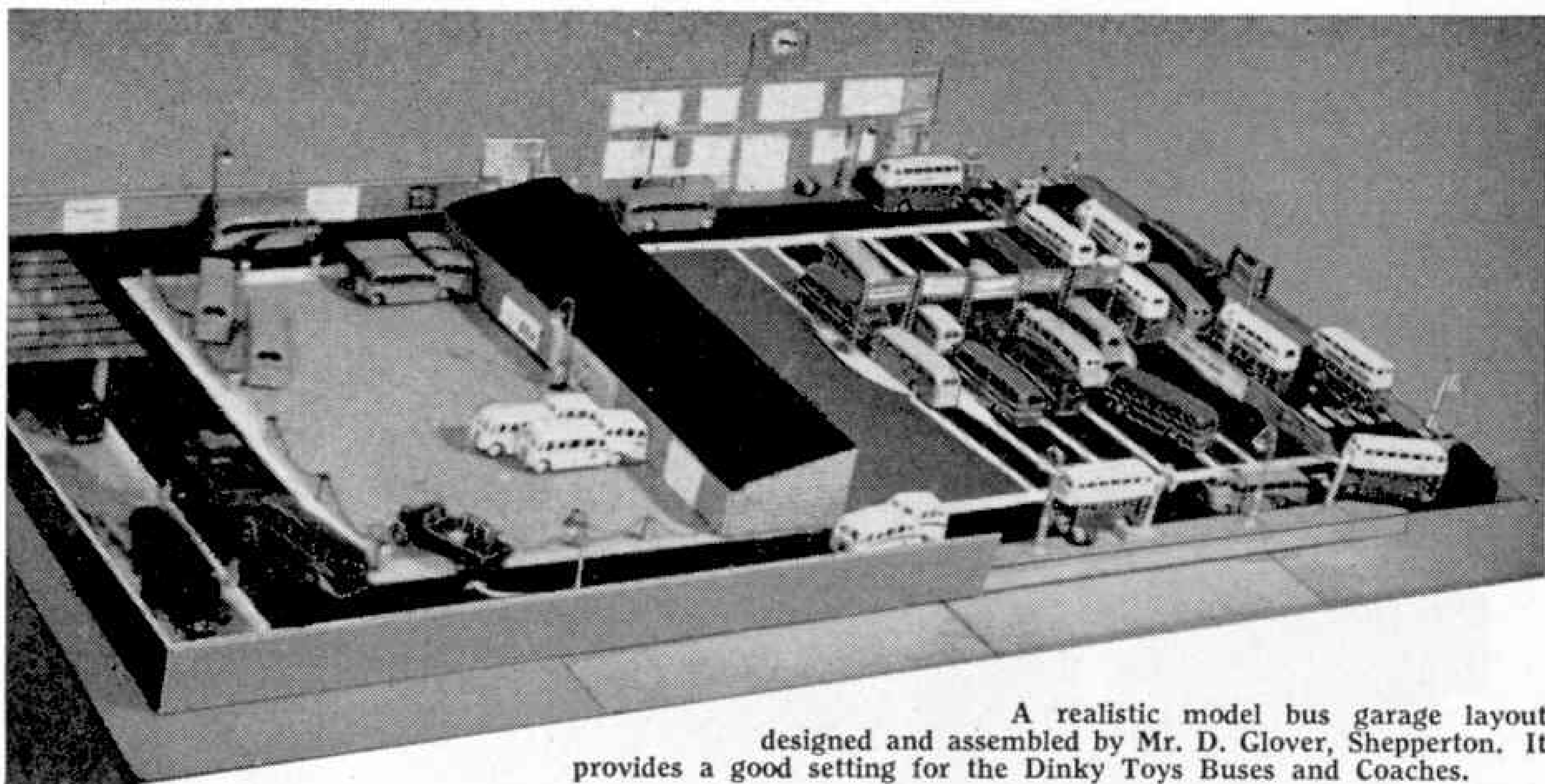
My picture shows the model negotiating a particularly tricky part

of a rough mountain section, the kind of road that may be met in the Monte Carlo or the Alpine Rally. The driver apparently has been fortunate in his choice of route, as there is no sign of the snow and ice that make the Monte Carlo Rally such a severe test of men and machines, but he must be extremely grateful for the superb springing of his Jaguar!



Here Dinky Toys No. 157, Jaguar XK120 Coupé, appears to be negotiating a particularly rough stretch of road in a rally.





A realistic model bus garage layout designed and assembled by Mr. D. Glover, Shepperton. It provides a good setting for the Dinky Toys Buses and Coaches.

The other new model is of a very different type, but it has already aroused as much interest as its more famous companion. It is the second of the new series of Dinky Toys army models, and is based on a Bedford 3-ton vehicle. The model is finished in Service green and includes a wealth of detail, such as an observation hatch in the roof on the passenger side of the cab, and the rope lacing used to attach the cover firmly to the sides of the body. A spare wheel is fitted between the cab and the body, as on the real vehicle. The model has the Royal Armoured Corps sign at the front and rear, as in the case of the Scout Car, so that these two models can be used together in the transport section of a miniature army unit.

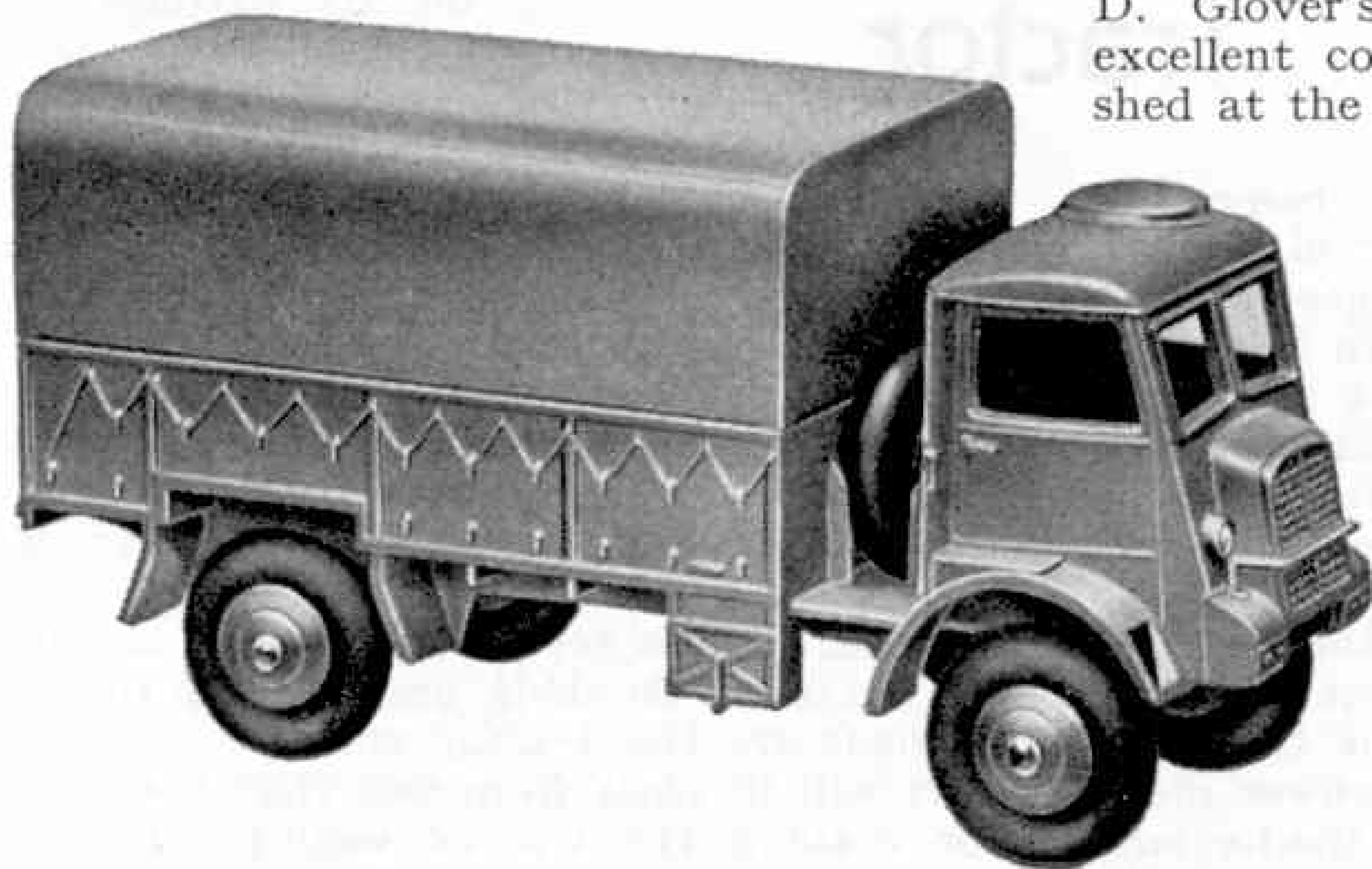
There are more new Dinky Toys to follow the Jaguar XK120 and the Army Covered Wagon, all as attractive as these

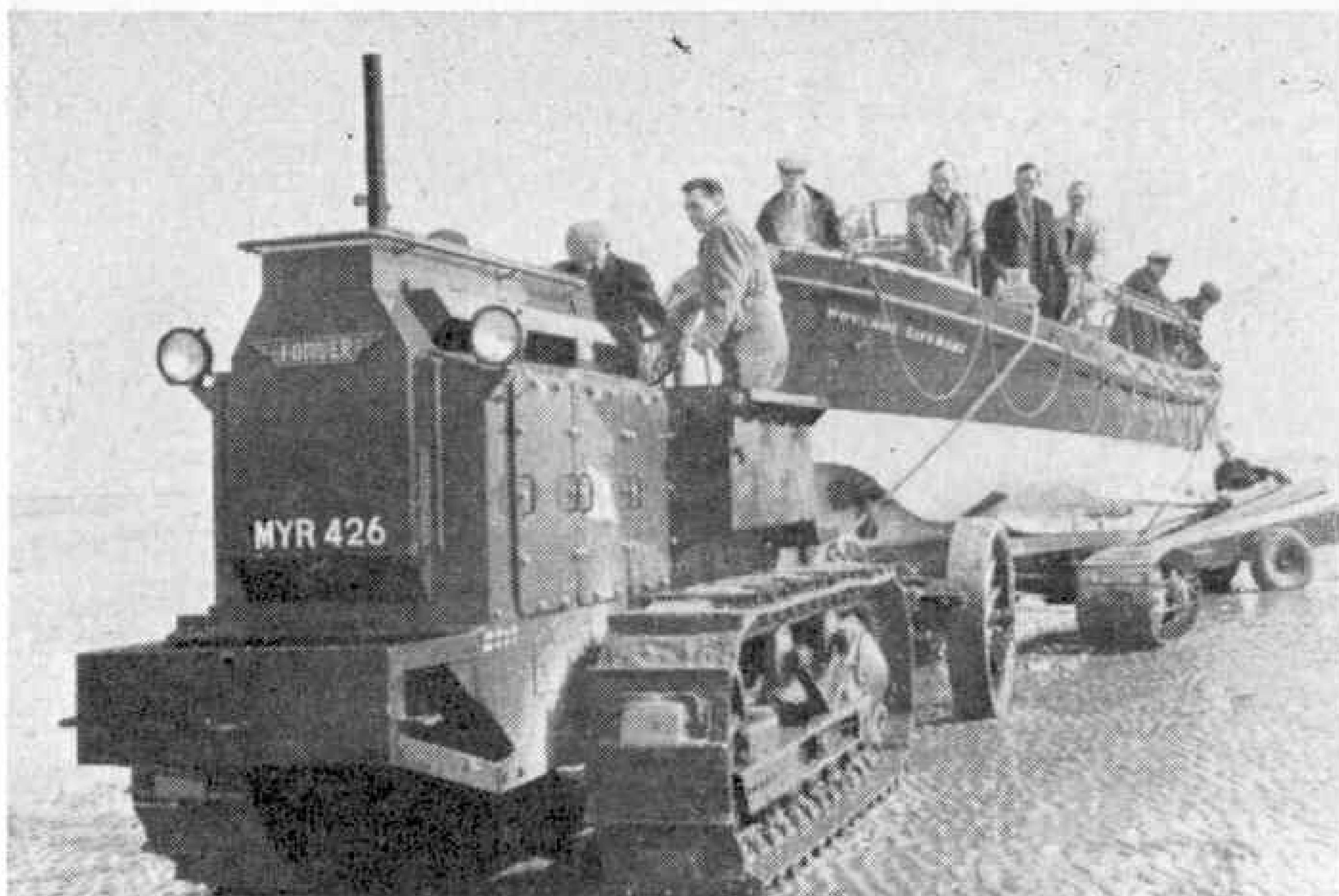
are, and perhaps to some of you even more interesting. So look out for further announcements.

So much for the most recent additions to the Dinky Toys range, and now for a brief description of an interesting layout that makes use of the Buses and Coaches that have been firm favourites with collectors for a long time. The layout was made by Mr. D. Glover, Shepperton, Middlesex, and is pictured at the top of this page. It is evident that this layout is the result of careful thought and planning, for the whole scene has a businesslike air that immediately suggests to the observer a busy bus terminal. There are facilities for refuelling at the filling station in the foreground, and there is even a ramp for routine inspection and maintenance of the vehicles as they come off duty.

The long distance luxury coaches of D. Glover's layout are provided with excellent covered accommodation in the shed at the centre of the picture, so that they can be kept in the first-class condition expected by the passengers in these vehicles. The main office building is directly in front of the loading islands, each of which is marked with destination indicators. A total of 40 Buses and Coaches operates from the terminal.

A new Dinky Toy that has been long awaited by keen collectors interested in military vehicles. It is the Army Covered Wagon, Dinky Toys No. 623.





The new tractor on the sands with the Hoylake life-boat on its carriage. Our illustrations are reproduced by courtesy of the Royal National Life-Boat Institution.

FOR those who live by the sea, and indeed for many inland visitors to seaside places, there is no more alarming and exciting moment than when the sound of exploding maroons calls out the members of the life-boat crew. No time must be lost in getting a life-boat into the water and on its way, for even a short delay may make the rescue efforts futile.

The New Brighton life-boat is already in the water when the maroons give the signal for the crew to man her, as she is moored off the landing stage where the New Brighton ferry boats from Liverpool arrive. But for most boats some means of launching is necessary. In the past they have been launched by hand and by horses. Today the tractor is taking the burden, and there is no doubt whatever of the value in this respect of that modern source of power in dealing with boats that with their carriages weigh up to 14 tons. The illustration on this page shows the Hoylake life-boat with its tractor, and a glance is sufficient to show that the quick launch required to save lives at sea calls for the power and speed that only a tractor can give.

The tractor shown is the Fowler Challenger 3, which has been specially adapted for the purpose. This tractor is fitted with a 95 brake horse power diesel engine, one version embodying the Leyland 6-cylinder engine of that type and the

gears and four reverse, so that it is capable of using its immense power to the full in any circumstances. It has a drawbar pull of 21,100 lb. and is equipped with a Fowler winch that has a pull of 38,500 lb.

The Challenger 3 is made by John Fowler and Co. (Leeds) Ltd., who were invited by the Royal National Life-boat Institution to design a version suitable for their purpose. This of course meant that modifications had to be introduced. To see what those were, the way in which the tractor is used had to be considered. In some instances the haul down to the water may be very long at low tide,

possibly even amounting to several miles. After reaching the water line the life-boat on its carriage is reversed into the water, and the tractor is then

detached into deeper water, making use for this purpose of its specially constructed front buffer plate. Two ropes attached to the stern of the boat, one on each side, are carried forward over pulleys on the seaward end of the carriage and back to the front towing eyes of the tractor. When the tractor is reversed the life-boat is then pushed out of its carriage, and into the sea. On its return the boat is hauled up the beach on skids, and back on to the carriage by the tractor winch.

It will be clear from this that the need for making the tractor waterproof, and capable of operating continuously at full

## A New Life-boat Tractor



power when it is in water several feet in depth, is of the very highest importance. The engine therefore is completely encased and the tractor itself is made watertight throughout. Access to the engine can readily be obtained if required through panels left in the casing to allow this.

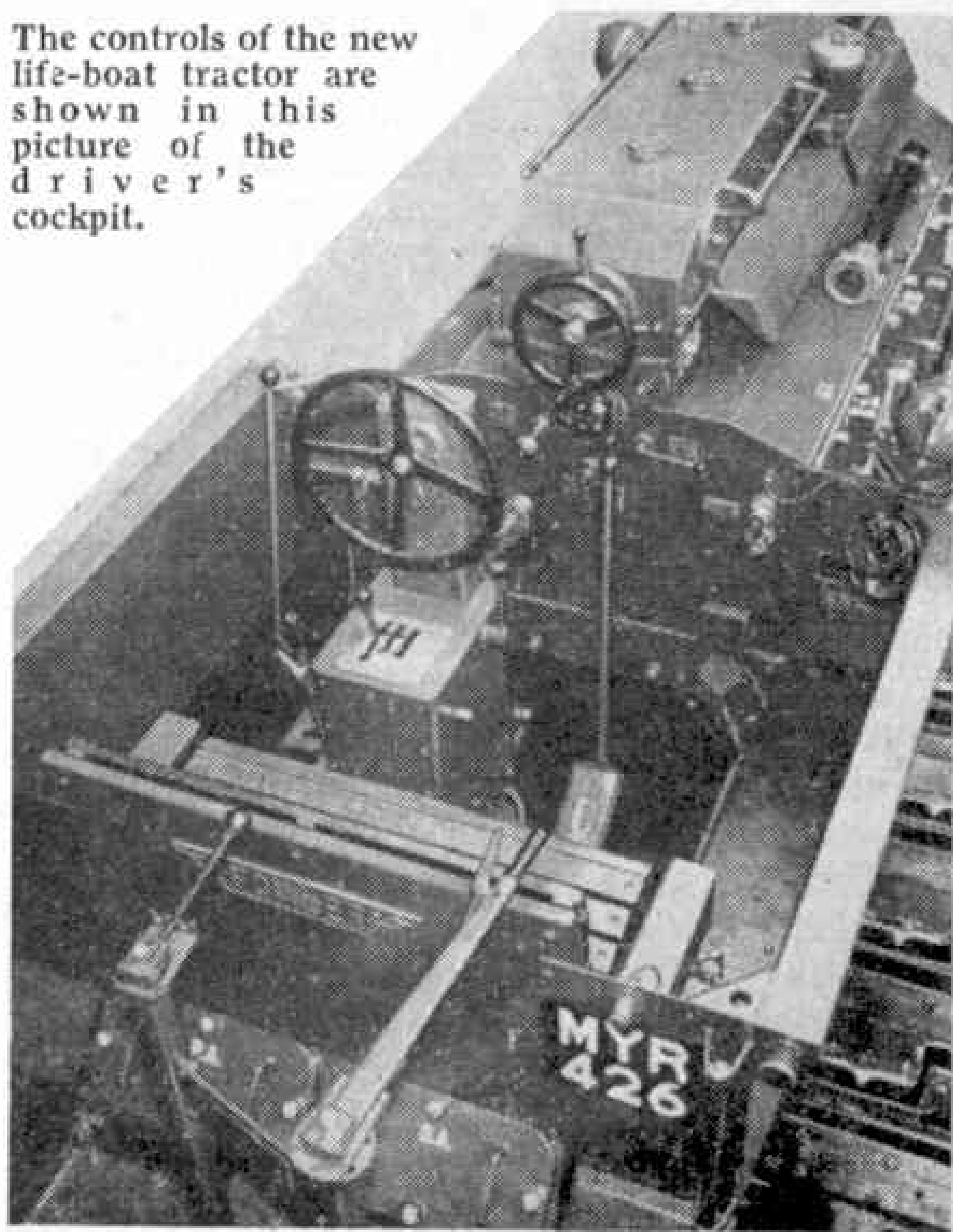
At times a tractor may be bogged down in shifting sand and mud banks, and only recoverable at low tide. In the meantime it may be completely submerged. To prevent water from gaining access to the engine through the air intake and the exhaust ports, these are fitted with valves that can be clamped down in a few seconds by simply turning a handwheel in the driver's compartment. The engine is stopped automatically at the same time. The result is that when the tide has receded the tractor can be restarted, and then it can be either driven or winched out under its own power.

Unlike the normal crawler tractor, the steering of the life-boat Challenger 3 is done by means of a vertical handwheel, on a marine-type steering column in the

The new tractor is the Challenger 3, made by John Fowler and Co. (Leeds) Ltd., specially adapted for the purpose, as explained in the accompanying article.



The controls of the new life-boat tractor are shown in this picture of the driver's cockpit.



centre of the driver's cockpit. A glance at the lower illustration on this page will show the position of the wheel. Turning it partially to right or left declutches the drive to either side as required. Further turns progressively apply the brakes, the result of which is to tighten the circle in which the tractor is moving.

The fuel control levers also are mounted on the sides of the steering column. There is a hand brake for emergency stops and parking purposes, and the clutch and gear levers have been extended so that the driver can continue to operate the controls when the cockpit is submerged.

The small hand wheel that in the picture can be seen in front of the driver's seat is the control for air valves. The change speed gear lever is easily recognised, and the long lever on the left of the steering wheel is the forward/reverse gear lever, while the corresponding lever on the right of the steering wheel is the over-centre engine clutch lever.

The tractor develops a draw-bar pull of 21,100 lbs. through its six-speed gear-box, and the specially designed winch with which it is fitted would enable it to exert a maximum pull of 38,500 lbs.

It is impossible in a short article to give details of every modification that has brought this fine tractor to the service of the life-boat men of the country. Some of the items incorporated have been produced after years of research and thorough tests, among them oil gauges, control board switches, lamps and cable connectors, and all the designs adopted were tested exhaustively under operating conditions.

# Operation Becher's Brook

By John W. R. Taylor

IN my article on the North American Aviation company in last month's *Meccano Magazine*, I mentioned that several Royal Air Force fighter squadrons are being re-equipped with North American Sabres, built at Montreal by Canadair Ltd. Behind this simple statement of fact lies a very remarkable story of achievement, courage and skill—a story in which American designers, Canadian engineers, British pilots and many others all played their part, only half-concealed by the code-name of "Operation Becher's Brook."

Most of you will have heard of the original Becher's Brook, the famous water jump which has ended the hopes of so many

thoroughness, they were soon producing so many Sabres, and of such high quality, that the U.S.A.F. ordered some to supplement production at North American's own factories. Even then, there were enough left over to supply the R.A.F. too under the Mutual Security programme.

The first Canadair-built machine flew on 9th August 1950 and was basically similar to the U.S.A.F.'s original production version, the F-86A. In accordance with British procedure, it was designated Sabre Mk. 1. This version did not, however, enter service with the R.C.A.F. as, by then, North American had developed the F-86E Sabre with a "flying tail," to improve

manœuvrability and handling in the air. It is this version which Canadair have built for three years as Sabre Mk. 2 and 4, with General Electric J-47 engines supplied from the United States, and with which we are concerned in this story.

Transatlantic air ferrying is, of course, no new thing. Thousands of bombers and fighters were flown across the Atlantic during the war; and U.S.A.F. and R.C.A.F. aircraft still follow the same



R.A.F. Sabre aircraft lined up at St. Hubert, Montreal, Canada.

horses and riders in the Grand National race. Its counterpart in "Operation Becher's Brook" was even more of a jump—3,100 hazardous miles, mostly over the icy, formidable Atlantic ocean between Labrador and Scotland. The "riders" were pilots of No. 147 Squadron, R.A.F. Transport Command; their mounts the 376 Sabres needed so badly by the Royal Air Force, whose Meteors and Vampires were outclassed by the more modern sweptwing jets of the U.S.A.F. and Soviet Air Force.

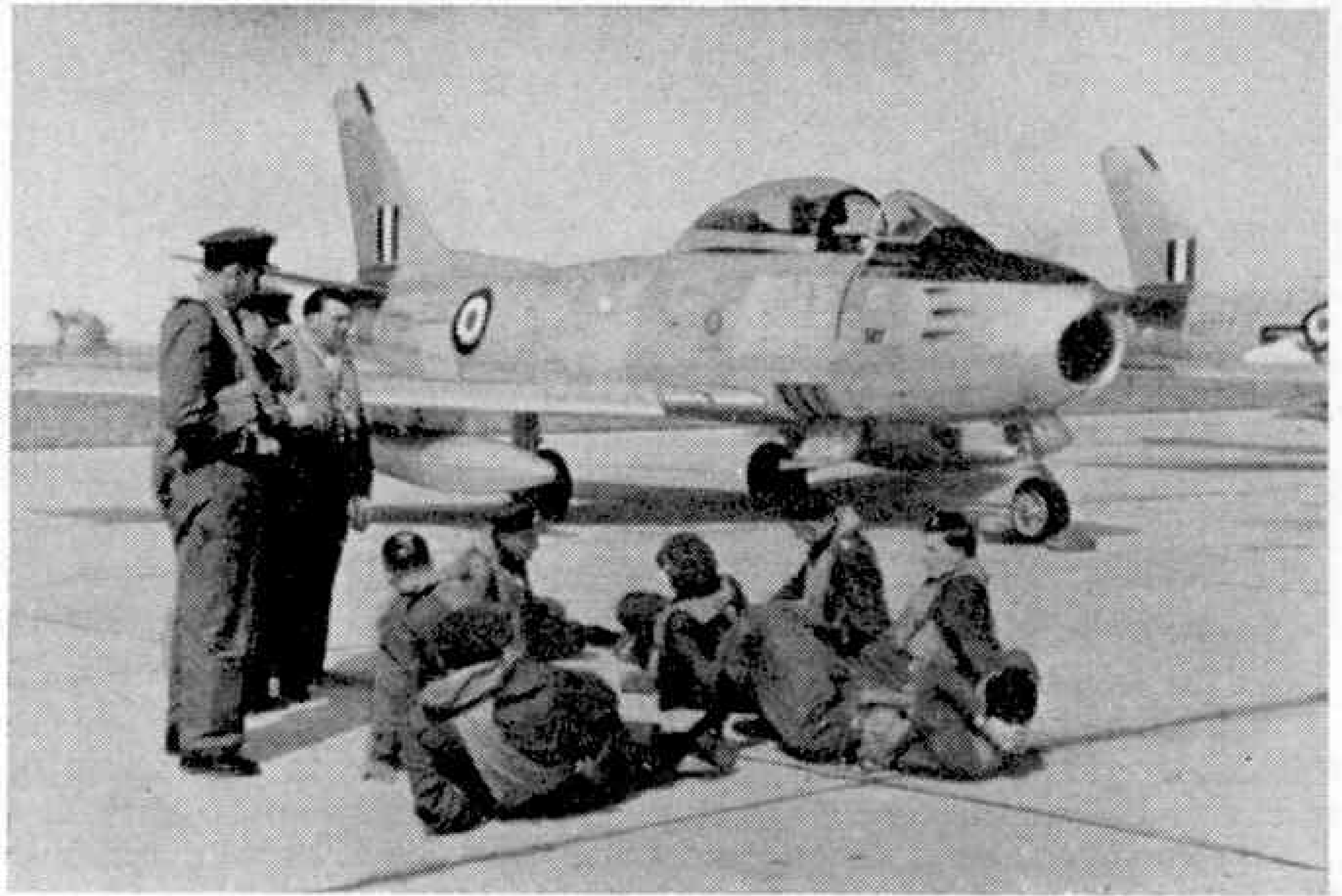
The story really began back in 1949 when Canadair Ltd. acquired the licence to build Sabres for the Royal Canadian Air Force. With characteristic energy and

old route, via Greenland and Iceland, when units are sent to Europe for training or as part of the regular N.A.T.O. defence forces. But jet fighters drink fuel at an alarming rate; and there is a world of difference between flying single-seat, single-engined jets, where the pilot is his own navigator and wireless operator and has no generous fuel reserve for diversion to another airfield in bad weather, and operating large transport aircraft or bombers with four engines, a full crew and long range.

Nevertheless, the cost of dismantling and "cocooning" the Sabres for transport by ship, and their re-assembly and flight testing in England, seemed an awful waste



Ferry pilots waiting at St. Hubert to take off on "Operation Becher's Brook."



of time and money; and the matter was settled when Air Chief Marshal Sir Ralph Cochrane, then Vice Chief of the Air Staff, pronounced that aeroplanes were meant to fly and not to travel as passengers aboard ship.

The R.C.A.F. already planned to fly some of their Sabres across the Atlantic in "Operation Leapfrog"; so three R.A.F.

observers were detailed to travel with the Canadian Units in the summer of 1952 to see how the experiment worked. And when "Leapfrog II" followed, three more R.A.F. pilots took part in the mass flight, this time in Sabres intended for R.A.F. conversion training in England.

One of the three pilots was Squadron Leader T. Stevenson, A.F.C., a 36-year old R.A.F. veteran with 4,500 flying hours in his log-book and one of the few survivors of the gallant airmen who flew Battle day-bombers in France in 1940. His report on "Leapfrog II" persuaded the Air Ministry that "Operation Becher's Brook" was practicable, and he was put in command of the pilots of the R.A.F. Overseas Ferry Unit who were chosen to fly the Sabres.

The R.C.A.F. agreed to assume operational control of the flights; the U.S.A.F. offered to provide communications and other facilities. The R.C.A.F. also trained the British pilots in little over a month, and on 8th December 1952 the first R.A.F. Sabre ferry convoy, "Becher's Brook I," left Bagotville, Quebec, for Goose Bay, Labrador. The journey to England continued via Bluie West One, on the south-west coast of Greenland, Keflavik in Iceland, and Prestwick, Scotland. But only eight of the twelve Sabres which left Canada were delivered safely, and it was unpleasantly obvious that prolonged delivery flights of large formations in all weathers, over such a treacherous route, demanded much more careful planning than that needed



This striking photograph shows one of the R.A.F. Sabres taking off at St. Hubert.



The hangar and control tower at the Royal Canadian Air Force Station, Goose Bay, Labrador.

for a single crossing by one or two squadrons.

To ensure success a new organisation was needed, able to control aircraft and men spread over 2,000 miles of routes, even when communications were blacked out by magnetic storms. Nor was it sufficient merely to teach pilots to fly the Sabres; they had to be built up to withstand the mental fatigue of frustrating delays caused by weather and other factors. And they had to be taught how to survive a forced landing in one of the most inhospitable regions of the world—the bleak, menacing Greenland ice cap. Out of these requirements grew No. 1 Long Range Ferry Unit, which was later renamed No. 147 Squadron, after one of the most famous wartime transport squadrons of the R.A.F.

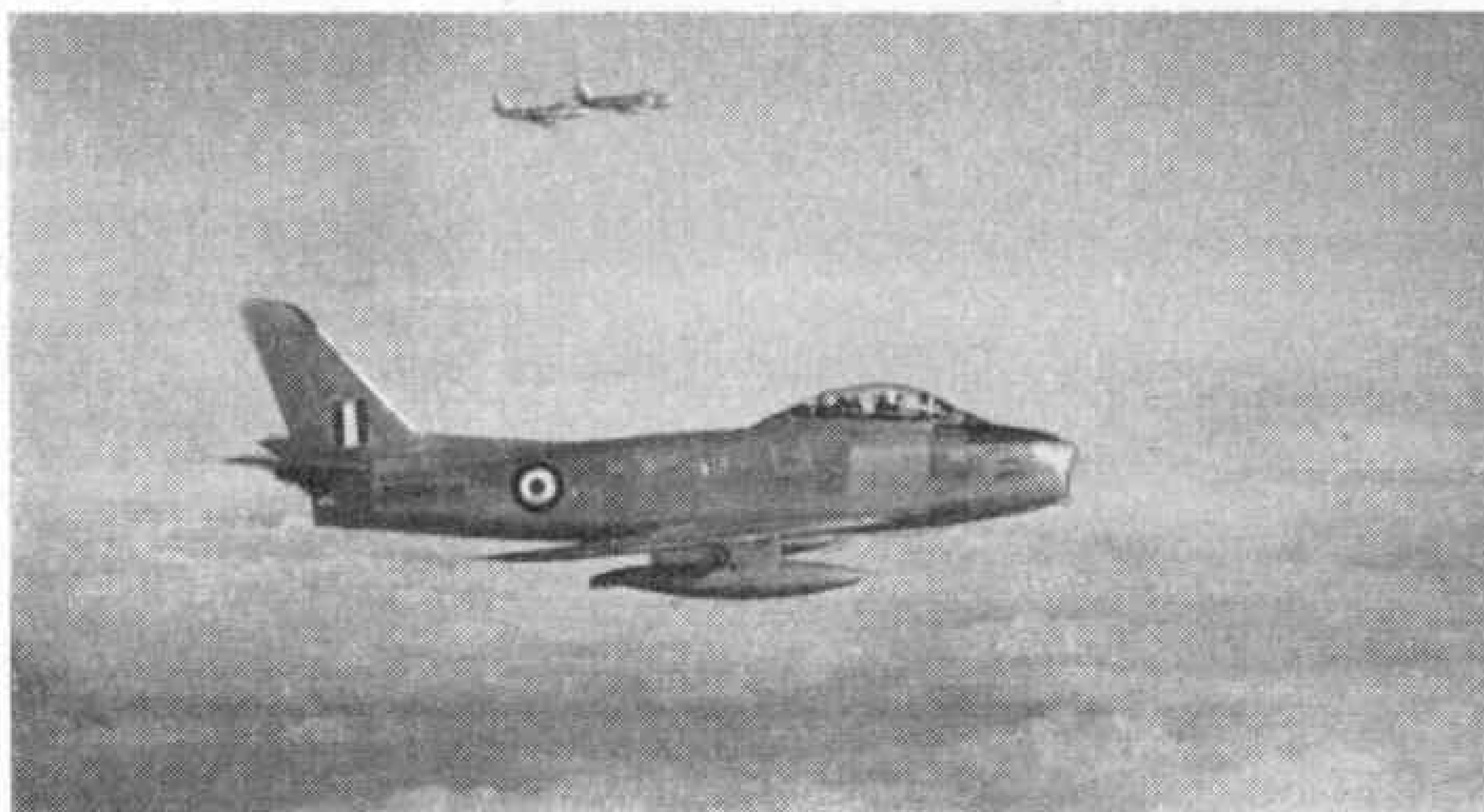
Its strength was increased to 60 pilots, by selecting men with at least 400-500 hours of jet experience from Fighter Command and the 2nd Tactical Air Force. Sq. Ldr. Stevenson remained in command, and pilots who had flown the route were

made flight and section leaders. Hastings transport aircraft were provided to fly the pilots and their equipment to Montreal, from where future ferry flights would start, and to carry the specially-trained ground crews. The latter were divided into two parties, who were flown to the first two airfields on the aircraft's route, each party subsequently leapfrogging ahead of the other to await the Sabres at each stage of their journey.

More attention than ever was given to training. New pilots had to complete 10 hours familiarisation and conversion flying on the Sabre, and various ground courses, in England, before going to Canada for a rigorous seven-day survival course in the Labrador forest. After that came more detailed technical instruction on the Sabre and a further 15 hours' flying at St. Hubert, Montreal.

Meanwhile, the ground crews were given equally thorough instruction; with emphasis on the fact that, in such a unique operation, textbook methods and equipment are often useless. A cheap handmade tool that can be

Part of a convoy of Sabres flying at 35,000 ft. over Greenland during "Operation Becher's Brook."





packed in a convenient corner is often preferable to a de luxe automatic device. Similarly, the method of doing a particular job that is satisfactory in a hangar may easily result in frayed tempers and tattered fingers when attempted in a foot of snow and sub-zero temperatures, under the midnight sun. Often, men would have to do jobs outside their own specialised trades, but the important thing was to do them cheerfully and keep the aircraft flying while the weather remained kind.

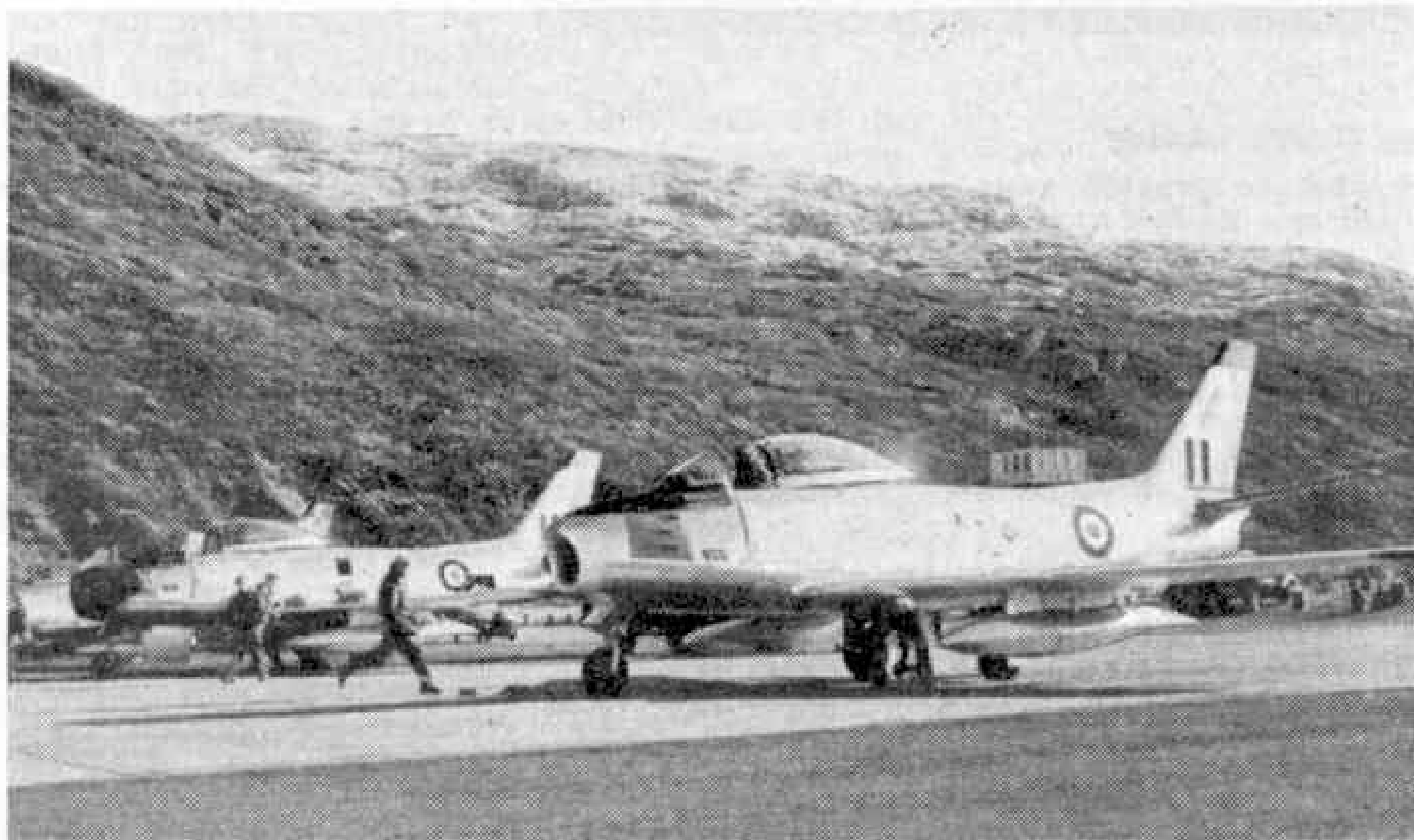
Finally, it was decided to synchronise "Becher's Brook," whenever possible, with R.C.A.F. "Leapfrog" and U.S.A.F. ferry operations, so that full use could be made of all available safety and navigation arrangements.

At last all was ready for the first test of the new organisation. What happened has

to await the signal for take-off.

To conserve fuel, engine running was limited to five minutes, and the aircraft left in pairs climbing at full throttle to 35,000 ft., to take advantage of lower fuel consumption and, usually, more favourable winds encountered at that height. Along their route, the pilots were able to "home" on radio signals transmitted by Albatross rescue amphibians of the U.S.A.F., further help being given by the Atlantic weather ships. In bad weather, they were able to "let down" on instruments at their destination, using a radio compass to guide them into the airfield.

There the ground crews took over, while the pilots went for a meal and further briefing. No time could be wasted, because, if the weather permitted, a second stage had to be flown on the same day. Some 25,000



Preparing to take off from Bluie West One, Greenland, for the next stage of the long flight to England.

been described in detail by Sq. Ldr. Stevenson.

Some hours before the start, the radio teleprinters were busy, passing information on weather, the condition of airfields along the route, fuel, radio and navigation data. Two hours from take-off liaison officers 700 miles apart, at each end of the first leg, checked final details, while ground crews put the finishing touches to the Sabres and the pilots worked out their course.

After briefing, the pilots donned their long woolly underpants, string vests, rubberised immersion suits and "Mae West" lifebelts, which gave them the only possible chance of surviving a ditching in the icy seas. Kit was stowed away in ammunition bays and other cubby holes and, after a last-minute check over the aircraft, the pilots strapped on their parachutes and helmets and clambered into their cockpits

gallons of fuel had to be poured through about 250 filler caps—any one of which might be so cold that it would remove the skin if touched with a bare hand—in under two hours, apart from checking oil, oxygen and radio gear.

Only by devotion to duty, skill and endurance on the part of air and ground crews could such operations be flown at all. That they were completed with almost incredible success is the finest possible tribute to No. 147 Squadron, whose pilots pride themselves on the fact that they normally landed at their destination on each leg of the route within 30 seconds of their estimated time of arrival.

Operation "Becher's Brook" was completed at the end of last December, when the last Sabre in the last of the convoys was delivered to the Maintenance Unit at the R.A.F. Station at Kemble.



A London Midland Class 5 4-6-0 No. 45268 breasts the summit at Aisgill with an up train from Edinburgh to St. Pancras. Photograph by H. Weston.

Class D33 became extinct when No. 62464 was condemned. This was a North British Railway 4-4-0 mixed traffic design dating from 1909-10. Ex-N.B.R. 4-4-0s of later type have been noted at Newcastle, N.E.R., and also working out of Princes Street, Edinburgh. C16 class 4-4-2Ts of the larger N.B.R. series have been running between Perth and Dundee.

Over the steeply graded Waverley route, the main line between Edinburgh and Carlisle via Hawick, among unusual locomotives reported have been a Clan 4-6-2, a Jubilee Stanier 4-6-0 and A2 Pacifics from the N.E. Region. A3 No. 60097 *Humourist*, the only Pacific

of the class fitted with double chimney and blast pipe, recently went on loan from Haymarket to Carlisle (Canal) shed, which provides power for some of the principal Waverley route trains.

Another conversion from V1 to V3 2-6-2T, having boiler pressure raised to 200 lb. per sq. in., is No. 67615. Compound 4-4-0, No. 41178 has been condemned.

#### Modernised Refreshment Rooms and Staff Training

Many of our station refreshment rooms are much smarter than they used to be; there is an attractive brightness about their equipment and furnishings, as well as in their display of food. There are 333 of them, of one sort or another, large and small, some including dining rooms, while the tendency at busy stations is to provide cafeteria meal facilities when rebuilding takes place, so enabling a larger number of people to

be served more quickly.

What was at one time a tearoom on the concourse at Marylebone terminus in London is now a highly organised training centre for refreshment room staffs, providing instructional courses of a week or longer. Cooking, preparation, display and service are among the many topics covered.

#### Finale on the Kent and East Sussex

On a fine but wintry afternoon and evening in January last, hundreds of enthusiasts and others travelled and watched along the rural Kent and East Sussex track, between Headcorn, on the S.R. Folkestone main line in Kent, and Robertsbridge, on the Tonbridge-Hastings direct route. It was closing day! Announcements displayed for some time had foretold the withdrawal of all services on the Headcorn-Tenterden section, including freight, and of passenger trains between Tenterden and Robertsbridge or, in other words, throughout the 21½ miles of this quiet little single line. This has never done much business, at any rate for about 49 weeks in the year, and remained in private ownership until absorbed into the Southern Region, B.R. in 1948.

As usual recently, the last trains on the Headcorn section were hauled by 01 class Stirling S.E.R. 0-6-0s Nos. 31064-5. A six-coach special into Robertsbridge and back was powered by two Terriers, small

#### More Diesel Passenger Trains Coming

British Railways have decided to provide more lightweight multiple unit diesel sets similar to those under construction for service in the West Riding of Yorkshire and in Cumberland. They are to run when ready in Lincolnshire, East Anglia, between Newcastle and Middlesbrough and also between Edinburgh and Glasgow. For the latter route the vehicles will be suitably equipped for longer runs, and buffet cars will be included in the sets.

All four schemes will be partly in substitution of steam services, and partly to augment them. The greater flexibility of the diesel units should enable better facilities to be provided of a type likely to create fresh business. The total expenditure will extend to more than £2 million, but this enterprising development seems certain to prove popular and be fully justified.

Derby Works are to build 34 two-car units, the diesel engines being supplied by contractors. Other production arrangements are being worked out. The units will usually consist of two coaches, one of which will be powered by two bus type under-floor engines of at least 125 h.p., the other being a trailer or another motor coach as required, drivable from either end. Sets can be joined together and operated as one train to suit passenger requirements.

#### Electric Train Speed Record

News is to hand of an electric train speed record created in France. A 4,500 h.p. electric locomotive, running with three coaches between Dijon and Beaune, reached a speed of 151.85 m.p.h.

The world record for a steam train was made by the former L.N.E.R. Pacific *Mallard* in July 1938, which attained a speed of 126 m.p.h., with a train of seven vehicles, weighing in all 240 tons.

#### Scottish Locomotive News

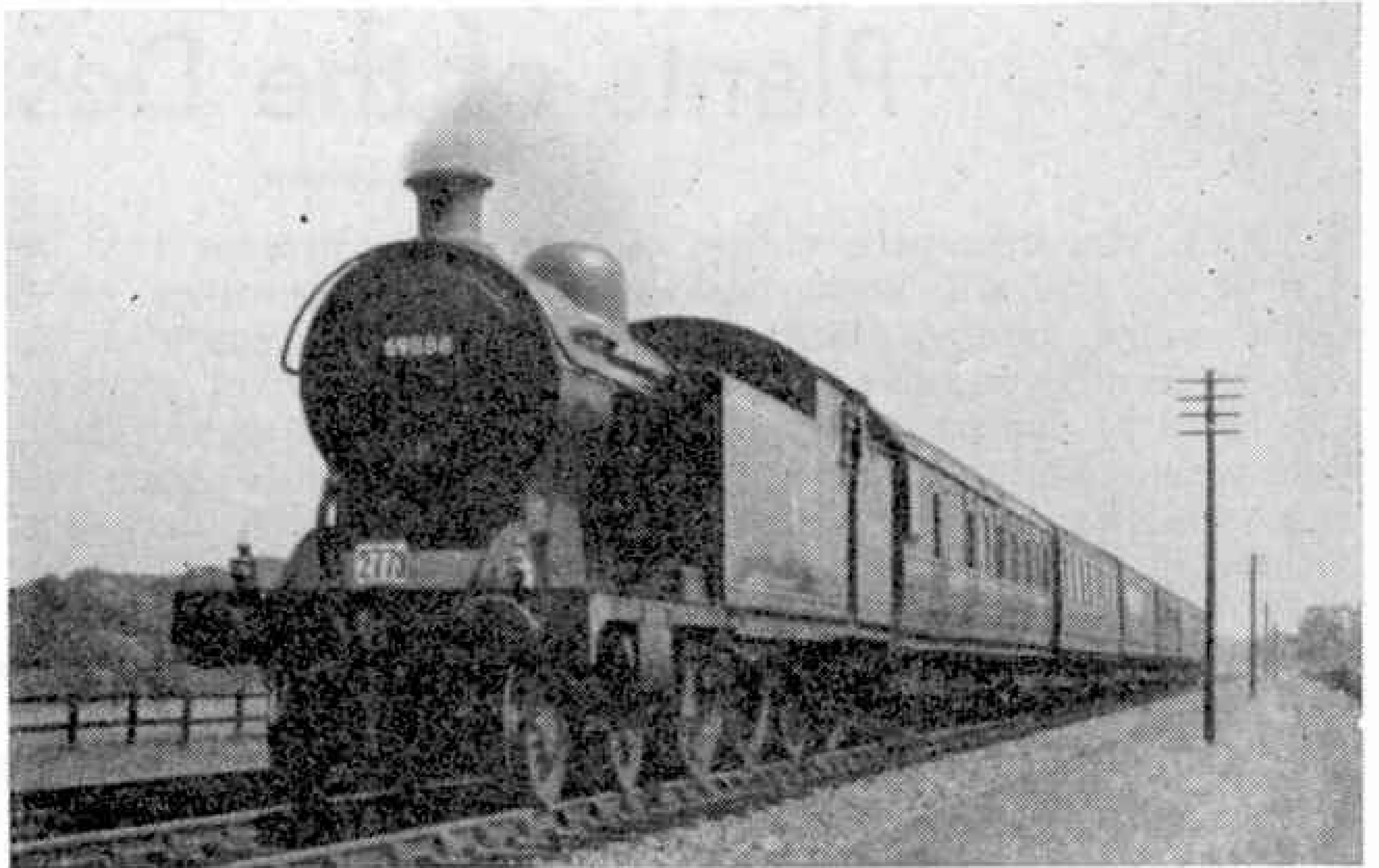
No. 54639 has been withdrawn for scrapping, so removing from the active list of former L.M.S. engines the last 4-6-0 of pre-grouping style. Though actually not completed until after the formation of the L.M.S.R. in 1923, this locomotive was of the Caledonian Company's 60 class modified and classified 4MT, having outside cylinders and driving wheels 6 ft. 1 in.

## Railway Notes

By R. A. H. Weight



A Whitby-York express near Strensall headed, rather unusually, by a tank locomotive, in this instance No. 69888, an ex-North Eastern engine. Photograph by C. Ord.



L.B.S.C.R. 0-6-0Ts of class A1x, one at each end so as to reduce weight on weak underline bridges. These two little veterans were numbered 32655 and 32678. Afterwards they travelled to St. Leonards shed, whence the daily goods trains to and from Tenterden are now operated. It may be that through London corridor trains will again traverse part of the branch, via Robertsbridge, during the three busier weeks in September, conveying hop pickers and their friends, with an A1x at each end.

#### London Midland Region

The first five new class 9 2-10-0s numbered 92000-4 were allocated to the Western Region after completion at Crewe.

At Derby class 5 standard 4-6-0 mixed traffic locomotives numbered 73047-9 were built; the first two of these were intended for 19B shed, Millhouses (Sheffield) and the other for 15C, Leicester. Also built at Derby were 350 h.p. diesel shunters Nos. 13034-9, for the Western Region, and Nos. 13040-1 for the Southern.

Small 0-4-0Ts completed at Horwich were Nos. 47008-9, to be shedded respectively at 10B, Preston and 6C, Birkenhead. Among engines withdrawn are Compound and Midland type 2P 4-4-0s, and the original Webb L.N.W.R. 2-4-2T, with 5 ft. 6 in. driving wheels, dating back to 1890, recently numbered 46601 and employed in the Leamington-Coventry area.

Track relaying work, including 90 pairs of points and over 170 crossings, has been carried out in conjunction with improved signalling and other works on a large scale during a number of week-ends at the western or north-western end of Chester station, where are situated the junctions for the Holyhead and Birkenhead lines also used by W.R.

No less than 9,055 exceptional loads, the highest number on record, were handled by the Region during 1953 in freight trains. The heaviest was a 119-ton

transformer conveyed from Rugby to Fiskerton, Notts., for a large power station. A very heavy consignment of steel plates travelled over 300 miles from Clydebank to London sidings on its way to Dover, S.R.

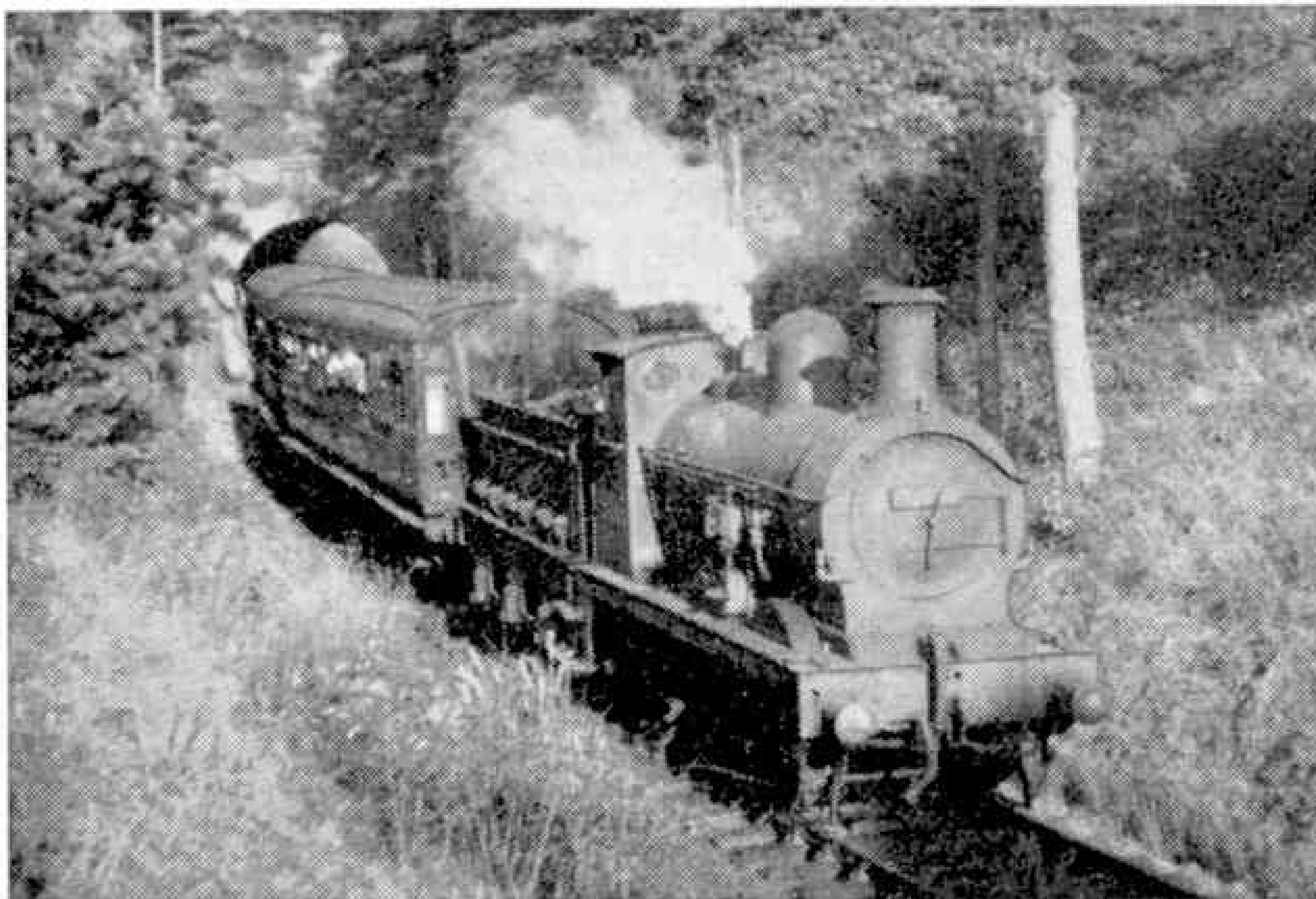
Two new electric baggage and parcel cars, converted from old compartment type passenger coaches, with motor bogie and driving compartment at each end, are running on the Liverpool-Southport-Ormskirk electric routes. There is accommodation for staff, and also for the conveyance of fish, and a vacuum-fitted freight vehicle can be hauled if required.

#### L.P.T.B. Developments

News from the extensive and extremely busy realm controlled by the London Passenger Transport Board covers several interesting topics. All regular underground and tube services are now operated with sets of coaches having automatic doors opened and closed electrically from the guard's compartment.

The jubilee has occurred of the Great Northern and City line, whereon frequent services run along a rather short, self-contained route between Moorgate and Finsbury Park. Built with the idea of accommodating full size Great Northern trains, though the scheme never materialised, the tunnels are much larger than the present standard tube diameter, and for a number of years the rolling stock was more of main line dimensions.

I expressed the hope in these notes last December that the former Metropolitan electric locomotives might appear again in red-brown livery. I am pleased to receive a report that as they go through works these are being painted a maroon shade, lined gold and black, with red buffers and underframes. The 16 engines have been renamed as before the war except that No. 2 is not *Oliver Cromwell*, but *Thomas Lord*, after the owner of the land on which Lord's Cricket Ground was laid out, now close to the Baker Street lines.



A "last-day" picture on the Kent and East Sussex line by S. C. Nash. Southern 0-6-0 No. 31065 leaving St. Michaels Tunnel with a Headcorn-Rolvenden train.

# Plants of the Desert

By R. Tenent

**H**AVE you become a victim of cactitis? If so, you will know how fascinating those weird, exotic plants of the desert can be. But if you have not yet experienced the thrill of cactus-growing, then perhaps you would like to hear something about this exciting hobby and the people interested in it.

Probably one of the chief delights of growing cacti is the great variety of plants from which to choose. There are well over 1,000 different species, all shapes, all shades and all sizes.

In this extensive family are to be found some of the most remarkable plants in the world. There are the Prickly Pear Cacti, bearing pale yellow flowers and crimson berries; there is the Old Man Cactus, so called because the upper parts of the stem have long, white matted hairs, giving the appearance of a very old man's head; there are the Thin-ribbed Cacti representing trees, bushes, vines, and so on; plants with edible berries; plants sweetly scented; and plants that only flower after dark.

Most cactus and succulent collections begin with a plant or cutting, probably a gift from a friend. Or it may be that a few seeds have been sown with good results, and so the interest grows. Take twelve-years-old John Hardwick, of Charing, Kent, for instance. John has been interested in succulents for about four years and takes the hobby very seriously. Nevertheless, it all began quite simply, he will tell you, when his father gave him two or three plants in which he himself was not particularly interested.

So fascinated was John with this unusual

present that he began to read up all the literature he could find on the subject. He spent all his spare time and most of his pocket money in collecting as many different plants as possible. Today he has more than 450 different specimens, in which he takes tremendous pride, and out of school hours he is usually to be found tending them. He also visits all the big shows and is able to discuss cacti and succulents with the experts.

Another young enthusiast is Mr. J. Norrington, of Surrey. Mr. Norrington began his collection at the age of 10 with the gift of three unusual plants from an aunt. He now has about 150 plants housed in a small greenhouse. His favourites are the globular cacti and in particular a species known as *Ferocacti*, which are spiny, barrel-shaped plants coming chiefly from Mexico and



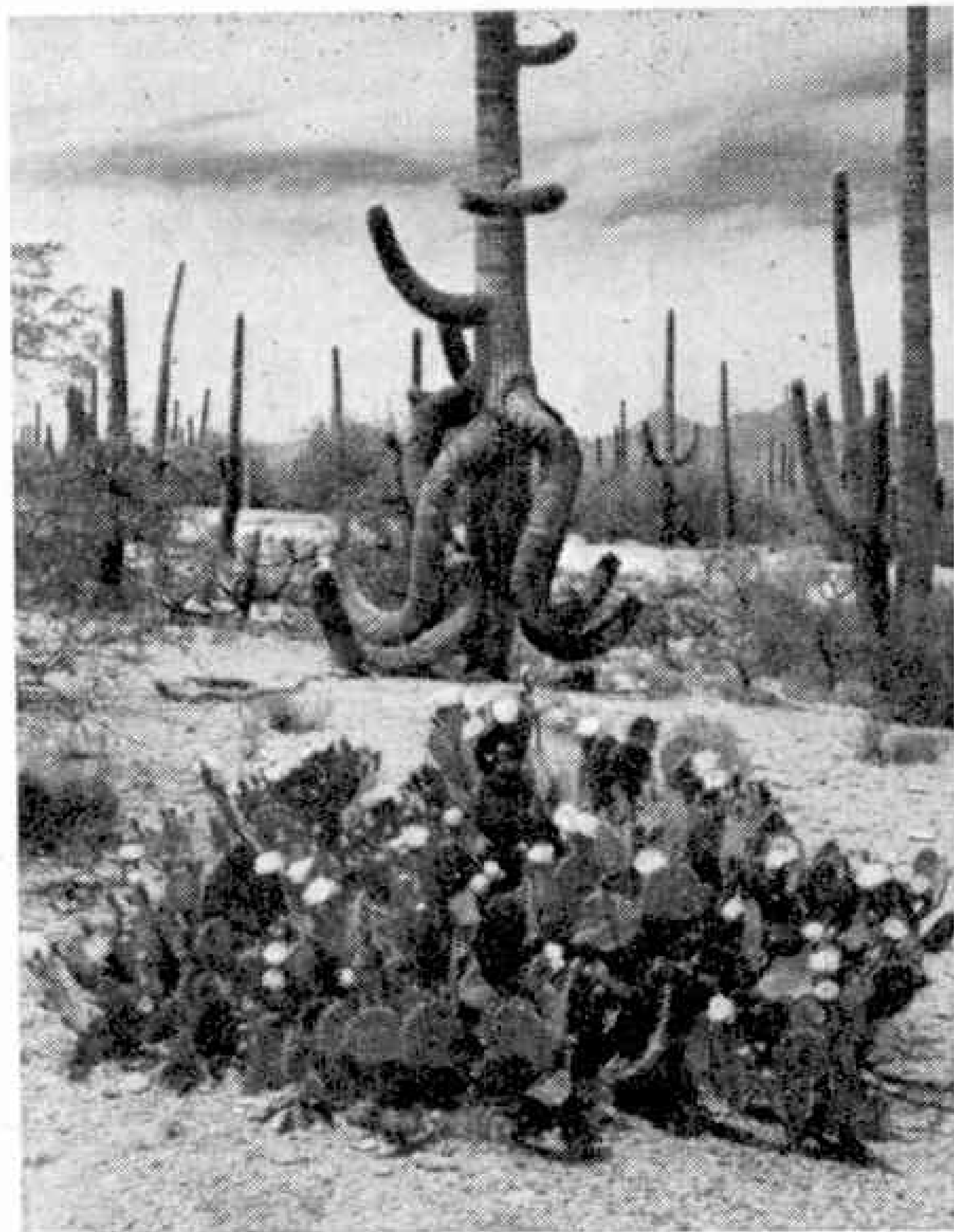
A young collector proudly shows his plants.

California.

But what exactly do we mean by cacti? And what is the difference between a cactus and a succulent plant? Plants which can survive long periods of drought by living on the water stored in their leaves, stems, or roots are all succulent plants. This large family includes all cacti, but it also consists of many other plants besides.

The name cactus comes from the Greek word *Kaktos*, meaning a prickly plant. The hall-mark of the true cactus is what is known as the areole. This is similar to a miniature pin-cushion and is situated at the base of the spines. The spines may be one or more in number, awl-shaped, curved, sheathed, stiff, papery, ridged, and so on. But plants that have spines without these little pincushions at the bottom cannot therefore be cacti.





Cacti vary tremendously in form and colour, but with the exception of the species known as *Pereskia* they produce very few leaves. Their natural home is the American continent, especially Mexico, Texas, Arizona, Peru, Bolivia and Argentina. A few types grow to as much as 60 feet in height in their natural surroundings. Others are more barrel-shaped and it is said that some of these are used by travellers in the desert as a source of water, which is practically tasteless and quite harmless.

In the American deserts the temperature during the day may be very high, but the nights are often cool. There are times when the cacti are covered with snow. Rain only falls at definite periods. It is, of course, impossible to imitate the exact conditions of these hot, arid regions. Nevertheless, if we want our plants to thrive we must do our best to provide as much sunlight as possible, and also to give them the right amount of water at the right times.

Stanley Scott, on the right, Hon. Secretary of the National Cactus Society, the largest of its kind in the world, and a colleague judging cacti.

In Arizona many cacti grow out of doors, like these *Opuntias* and *Cereus* plants.

Now for the "other succulents." These are also extremely varied in form and colour. Many species are very leafy, consisting of saucer-shaped or flat, green rosettes; others grow tall stems resembling miniature palm-trees; while yet others develop waxy coverings of beautiful pink or white tint which make them look like alabaster.

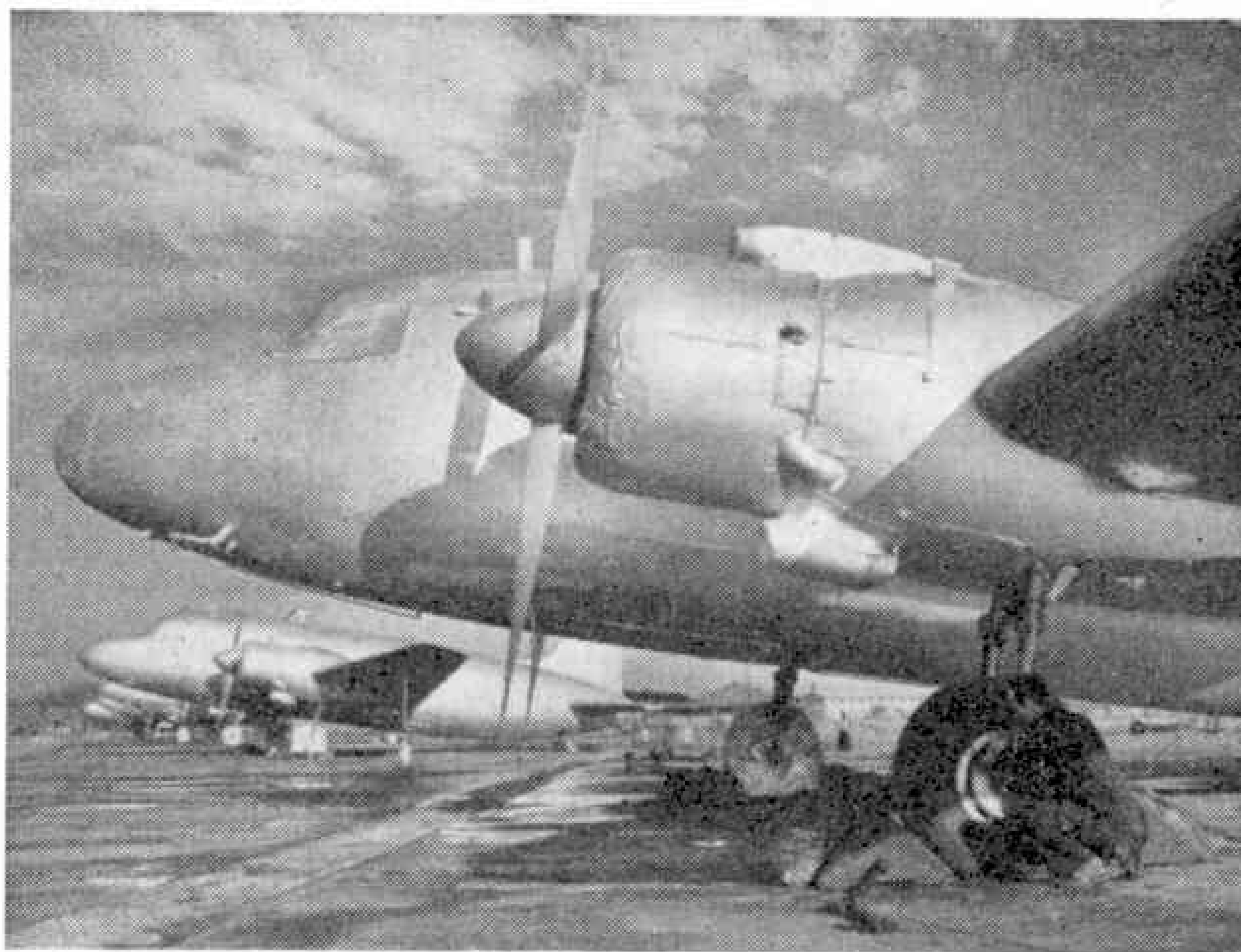
Among the better known leafy succulents are the sempervivums, popularly known as houseleeks. You may have seen them growing on the roofs of old country houses or in gardens. They are so easy to cultivate that it has been said of them:

"They never sulk, they never cry.  
They smile at every kind of sky.  
They grow on walls, on roofs they revel  
And thrive as well upon the level."

Perhaps the most fascinating of all the succulents, however, are what are known as Flowering or Living Stones. They come from the deserts of South Africa—Karoo and Namaqualand—and in form and colour are so like the surrounding stones that it is not easy to find them in their natural surroundings. Mostly small in size, many species imitate rock or gravel, other types resemble limestone, while still others could easily be taken for silvery white pebbles. Among the most sought after probably are the Lithops, because they so perfectly imitate the stones of their surroundings and bear such remarkable flowers, which are often bigger than

(Continued on page 206)





Cocooned Viking and Admiral air liners at London Airport. Photograph by courtesy of British European Airways.

## Air News

By John W. R. Taylor

### Admirals in Mothballs

Before the above title gives you any wrong ideas, perhaps I should explain that the *Admirals* being put in mothballs—or, to use the correct term, "Cocooned"—are veteran Viking air liners belonging to B.E.A.

Now that the Corporation have their fleets of Viscount and *Elizabethan*-class Ambassadors in service, they have retired nine of their ordinary Vikings and eight of the *Admiral*-class tourist-passenger conversions. With no hangar space to spare, the 17 aircraft have been sprayed with "Cocoon" protective covering to keep out the weather and will be parked in the open at London Airport until needed for service or sold. B.E.A. are still operating 20 *Admiral*-class Vikings—mostly on internal U.K. routes.

### The Nash Collection

News that the Royal Aeronautical Society have bought the collection of early aircraft formed by Mr. R. J. G. Nash, has revived hopes that we may one day have an Air Museum worthy of the great achievements of British designers and airmen. At the moment, the aircraft are stored in one of the Vickers' sheds at Brooklands. They include two 1910-11 Bleriot monoplanes, a Caudron G.3, Maurice Farman F.40, Avro 504 and three famous 1914-18 War fighters—a Sopwith Camel, Fokker D.7 and S.E.5A.

No details have been given of how, where or when the aircraft will be displayed. Certainly they cannot be accommodated with the National Aeronautical Collection at South Kensington, which is

already so overcrowded that Alcock and Brown's Vimy—first aircraft to fly the Atlantic non-stop—is displayed without its outer wings.

### The New Japanese Air Force

Japan's air force came into being again officially on 10th January last, with the formation of six wings, each consisting of 18 light liaison aircraft, based throughout the country. Headquarters and flying school are at Hamamatsu, in Shizuoka.

The units form the nucleus of the National Safety Force, which is expected to be equipped with jet fighters and long-range reconnaissance aircraft within the next two or three years. It will not be allowed to operate bombers and its size will be limited to about 1,000 aircraft. But it is a sobering thought that the Fletcher Defender lightplane, now being built in Japan, will carry rockets and napalm fire-bombs, making it as formidable as any warplane flown by Japanese pilots in World War II.

### R.C.A.F. Otter

The lower illustration on this page shows the first de Havilland Otter delivered to the Royal Canadian Air Force, who use it as a light transport aircraft and for search and rescue operations. Designed as a "bush transport," the rugged Otter is ideal for service in Northern Canada. It can take off in approximately four times its own length when operating on wheels, and has the added advantages of being able to fly slowly at low altitude, give good ground visibility and has large side-doors from which para-rescue personnel can jump.

The U.S. Services are also interested in the Otter, as a result of excellent service given by hundreds of smaller de Havilland Beavers with the U.S. Army and Air Force in Korea and elsewhere. Powered by a 600 h.p. Pratt and Whitney R-1340 engine, it can carry 9-14 passengers, or six stretcher cases.

In tribute to the late C. G. Grey, founder-editor of *The Aeroplane* and for many years a contributor to the *Meccano Magazine*, British European Airways have re-named their Pionair-Leopard class Dakota G-ALTT Charles Grey.



The Royal Canadian Air Force's first D.H. (Canada) Otter. Canadian National Defence Photograph.



### Supersonic Air Minister

A few weeks after ordering 70 S.N.C.A.S.O. Vautour twin-jet attack fighters for the French Air Force, Monsieur Louis Christiaens, the 63-year old French Secretary of State for Air, showed his confidence in the aircraft by flying faster than sound in the prototype Vautour. It was piloted by Capt. Glavani of the Flight Test Centre at Istres.

### D.H. Cold Air Unit

One of the problems of high-speed flying is to keep the pilot cool. A jet fighter flying at 600 m.p.h. at sea level, for example, can develop a cockpit temperature of 190 deg. Fahrenheit. Of this, 50 per cent. comes from skin friction as the aircraft flies through the air, 40 per cent. from the sun and 10 per cent. from the aircraft's electrical equipment and the heat of the pilot's own body.

The announcement that de Havilland are to build in England Hamilton Standard Cold Air Units is therefore good news for British pilots. Able to extract 150,000 B.T.U.s of heat per hour, the Unit works on the expansion principle and consists of a turbine-driven fan working in conjunction with one or more heat exchangers. Applicable to any jet or turboprop aircraft, the Unit is being built in two sizes, for large aircraft and fighters respectively.

### 1957 Model Britannia

Even before the first Britannia turboprop air liners are in service with B.O.A.C., Bristols are planning a bigger and better version for production in about 1957. Key to the improved performance of the new version will be a brand-new turboprop being developed by the company's engine division, and which is expected to give about 4,000 h.p. at sea level, although only half as large as the Olympus turbojet. Able to cruise at around 450 m.p.h., the developed Britannia, seating 100 passengers, would be a very serious rival to the next generation of turbojet transports, especially on the grounds of economy and its ability to fly non-stop for very long distances.

### A Million Helicopter Flight Hours

Most widely used helicopter in the world is the Bell Model 47, first produced in 1946 and still in full production at the company's Fort Worth, Texas, factory. Altogether, more than 1,000 of these aircraft have been built, and they have logged more than 1,000,000 flying hours in civil and military service,



The French Secretary of State for Air, 63-year old M. Louis Christiaens, being strapped into his ejector seat before flying faster than sound in the prototype Vautour twin-jet fighter.

on duties ranging from casualty evacuation in Korea to insect pest and weed spraying, power line inspection, air mail service, surveying, forest fire fighting, cargo lifting, ranching and aerial filming.

Illustrated at the foot of this page is a Model 47D used by the Port of New York Authority to fly its executives between Idlewild and Newark Airports and heliports on the roofs of its headquarters buildings. Equally familiar to New Yorkers are the Police Department's four model 47s, used for aerial patrol, traffic control and rescue work over the harbour and beaches.

### First Operational U.S. Missiles

The U.S. Department of Defense have announced that the first operational battery of Douglas Nike ground-to-air anti-aircraft missiles is being installed at Fort Meade, Maryland, between Baltimore and Washington. Rings of Nike batteries will eventually encircle many major cities and industrial targets in the United States.

Nike is a slim rocket, fired vertically with the aid of a large tail booster rocket. It is guided to its target by "riding" a radar beam, controlled by a complex firing mechanism on the ground containing 1,500,000 individual parts. There is no intention of replacing fighter aircraft with missiles yet; but readers with television sets will probably have seen newsreel shots of Nike being fired with great success against radio-controlled B-17 Fortress bombers. It has a range of about 18 miles and is supersonic.



Bell 47D helicopter operated as an executive transport by the Port of New York Authority. Photograph by courtesy of Bell Aircraft Corporation, U.S.A.



Two would-be taxi drivers receive advice before setting out on their bicycles for a tour of London streets, to extend their knowledge of the Metropolis.

positioning the front wheels in such a way that they can be locked over farther to left or right than those of ordinary cars.

The regulations governing the design are so exacting that today less than six motor manufacturers build vehicles of this type for service in London. Commodious, accessible, comfortable interiors are demanded, and some of the features insisted upon do not apply to other types of car. For instance, the floor of the passenger compartment must be flat—a point which accounts for the somewhat high-off-the-ground appearance of the London taxi. There must be ample space for luggage, and only accessories approved by Scotland Yard may be fitted. Until a few years ago, even streamlining was rather frowned upon, and although it is now permitted, priority must be given to the other features already mentioned.

Streamlining must not be allowed to interfere with the main functions of a taxicab—which are to provide convenient, safe, and prompt passenger transport.

The London cabby may own his own vehicle, or it may be the property of one or other of the taxicab companies. About 2,500 are owner-driven or shared by two drivers, who work on a shift system arranged between themselves. But every driver is not only required to pass driving and physical fitness tests; he must also show that he has an unrivalled and exhaustive knowledge of London streets and buildings.

Getting acquainted with the Metropolis to the full satisfaction of the licensing authorities entails several months' map study and many excursions on foot or on bicycle. The London cab driver is expected to know the positions of much more than the familiar landmarks. His knowledge has to extend to all the streets, one-way thoroughfares, short-cuts, clubs, restaurants, theatres, cinemas and parking places within six miles of Charing Cross. He also has to know the location of police stations, railway stations, courts, and hotels within at least 15 miles!

Is it surprising that, faced with the need to become a guide-book about London,

WHEN Londoners saw the first English *cabriolet*, a horse-drawn passenger vehicle introduced into this country from Paris in 1823, they little thought that in 1954 more than 6,000 mechanically-driven taxicabs would be plying for hire in the Metropolis. Yet that is the number operating today, and the London cabby provides a service that nowadays is as widely-known as it is useful.

London without its taxicabs indeed would be immensely handicapped. For reliability these vehicles are second to none, for no taxi is allowed to ply for hire on London's streets without first being inspected and approved by experts of the Public Carriage Office at Scotland Yard—and the tests are stringent. These familiar vehicles are designed specially for their job, too, and the work they will perform is borne in mind from the moment the outline of a new model appears on the designer's drawing-board.

One feature insisted upon is manoeuvrability, an essential requirement for the busy streets of London. The London taxicab is able to turn around in a smaller area than any other vehicle of similar size—almost, so to speak, on a sixpence. The designer provides for this by keeping the taxi as short as possible and

## "Taxi, Sir?"

By Arthur Turner



many prospective drivers have second thoughts about earning a living in this way? Yet the knowledge tests do ensure that successful entrants will be able to give the public the best possible service of its kind, and schools exist to give training in the work involved.

In South-West London is the British Legion's Taxi-Drivers Training School, where prospective

Prospective drivers travelling around the side streets of London on bicycles. In this way they find different buildings to which they may be asked to drive. This illustration and the one on the opposite page are reproduced by courtesy of the British Legion.

applicants for the official badge of the Public Carriage Office receive driving instruction and take lessons to extend their knowledge of Central London.

The text-book of the knowledge course is the "Blue-Book" issued by the Metropolitan Police, listing some 450 taxi runs around London. The successful trainee must learn this list by heart, so that he is able to state without hesitation the shortest route from, say, Finsbury Circus to Fulham Palace, or from the Horniman Museum to Hammersmith Bridge.

Acquiring this education usually takes at least six months' intensive study of street

plans, plus excursions afoot and by bicycle. During his out-of-doors instruction the trainee taxi driver expects to travel something like 7 000 miles, noting some 10,000 points and landmarks!

There comes finally an oral test at New Scotland Yard, the entrant being required to answer at once any of the 450



questions in the Blue-Book. He must also have more than a nodding acquaintance with the laws relating to taxicabs. For instance, it is a rule that articles of luggage more than 2 ft. long must be carried on the luggage platform if they are more than two in number, though this regulation does not apply to easily portable articles such as umbrellas and golf clubs. Another interesting point is that a driver is not legally required to accept animal passengers, though he may do so if he wishes.

Scotland Yard's interest in the London taxi services does not end with approving the design of the vehicles, testing applicants, and seeing that the general regulations are observed. Once a year every one of the 6,000-odd taxis is examined to ensure that no vehicle which is in the least degree unroadworthy shall ply for hire.

The condition of the bodywork, as well as the efficiency of the engine,



The authorities usually ban taxis that are more than ten years old, and an increasing number of smart turnouts, like the one seen here, are appearing in the London area. Photography by courtesy of Austin Motor Co. Ltd.



Future taxi drivers receiving engine instruction at the British Legion training school in Lambeth, part of the thorough training they must undergo.

steering, and other mechanical details, is checked, and in consequence it is rare for a London taxi to break down on the road.

The taximeters, which are of approved design, undergo special tests at a branch of the National Physical Laboratory, and regulations prescribe exactly how these must be fitted. To ensure that they will always show the correct fare, the cable drive is officially sealed against tampering.

The Public Carriage Office has four "passing stations," where regular inspections of taxicabs are undertaken, and a sixteen-page booklet lists the faults which may

The British Legion Taxi-Drivers Training School was established with the object of assisting ex-servicemen to pass the Metropolitan Police Examination and qualify as licenced motor car drivers in the London area. Here a class is seen under instruction on knowledge of London.

cause a "stop" order to be placed on any vehicle. Only after the faults have been rectified, and the taxi examined again, is it allowed to be used for hire.

Some of the taxis in London just after the war were more than ten years old and had registered more than 250,000 miles on their speedometers, but since new models became more readily available many of the veterans have been replaced. The aim is eventually to ensure that no taxi plying

from running round London streets, though whenever a vehicle is condemned under this Act, the option of modernising it is always given.

A post-war innovation is the two-way radio taxicab service, using cabs which can receive instructions by radio from a central broadcasting station. More than 200 taxis now operate under this system, enabling them to be sent to any point without delay.



When a would-be passenger 'phones to the headquarters, the message is radio-ed to a cab in the vicinity, and the number of "dead miles" (i.e., running without a passenger) is thus minimised. More and more use is being made of this idea, which benefits passengers as well as taxi owners, since it saves time for both.



# BOOKS TO READ

*Here we review books of interest and of use to readers of the M.M. With certain exceptions, which will be indicated, these should be ordered through a bookseller.*

## "2750: LEGEND OF A LOCOMOTIVE"

By H. C. WEBSTER (Nelson 8/6)

Here is a locomotive book that is "different," dealing with the adventures of engine No. 2750, an A3 Pacific of the former L.N.E.R., from the time of its coming new to King's Cross until it leaves the depot for general overhaul. "Twenty-seven-fifty" is allocated to an unassuming, but very competent engineman, Bob Eldridge, and the trio is completed by John Clark, a somewhat boisterous, but capable and loyal fireman, and with them we meet superintendents, inspectors, foremen and other men engaged in various fields of railway work.

Throughout this "legend of a locomotive" the author, who is himself a locomotive man, manages to give the reader a good deal of pleasant instruction in locomotive matters, footplate work and railway working. His characters too are interesting and their actions and sayings provide an attractive background to the story of the engine. Illustrations are numerous and except for the frontispiece in colour they take the form of drawings and informative sketches. The locomotive lover will like this book immensely, and those whose work has to do with locomotives also will enjoy it.

## "THE SCIENCE READER'S COMPANION"

Edited by G. E. SPECK (Ward, Lock 15/-)

The spectacular advances in the principal branches of science during the past 20 years, especially in the fields of nuclear energy, electronics, plastics and antibiotics, are producing far-reaching changes in our day-to-day lives. The widespread public interest nowadays in these matters is shown by the veritable flood of "popular science" books, and especially of "science fiction." This book provides a handy reference work for these new science enthusiasts, with its subjects arranged in alphabetical order.

No attempt has been made to cover all the sciences in this 256-page work, nor do the many short articles delve deeply in the subjects with which they deal. The aim has been rather to let the reader know what is meant by the many names and terms that are used in scientific discussion. The contributors have concentrated on those aspects of science which are now freely featured in films, radio, television, newspapers, periodicals and science fiction, and have succeeded in giving in their short articles a wealth of information that will be helpful to the general reader. The many excellent line drawings and half-tone pictures add greatly to the interest and value of the book.

## "TEACH YOURSELF ATHLETICS"

By F. N. S. CREEK  
(English Universities Press 6/-)

Readers who are keen on athletics will find in this new handbook a wealth of valuable information and practical guidance, whether they are interested in sprinting, middle-distance or long-distance running, jumping events, hurdling, pole vaulting and putting the weight, or in throwing the discus, javelin or hammer. Any reader who really practises the methods explained in this book will greatly improve his or her athletics. The final chapters deal respectively with relay racing and organising an athletics meeting. Excellent line drawings illustrate the chapters on particular athletics.

## "THE BOOK OF FLIGHT"

By KENNETH M. KING (Warne 5/-)

The first 50 years of Man's conquest of the air made up a half century of amazing progress, during which

flying developed from mere "hops" of a few yards in crude "stick and string" aeroplanes to long-distance flights in jet aircraft capable of travelling faster than sound. This book traces some of the important stages in that progress, from the early experiments with balloons, kites and gliders to the threshold of the jet age, and Man's dreams of space travel in the future.

The four colour plates, six black-and-white half-tones and thirty-seven line drawings complement the text and range through the same years of achievement.

## "FARES PLEASE"

Collected by O. J. MORRIS  
(Ian Allan 12/6)

As its title suggests, this is a book about passenger transport. Actually, it is the condensed though extremely detailed history of the surface passenger transport of London. Four different authors, each an expert in his particular field, have contributed to its fifteen chapters. The reader is introduced to the story in the very early days of the Shillibeer omnibus, when horses reigned supreme, and from thence onward through the development of buses and tramways up to the present day. Each type of vehicle receives its fair share of attention.

The story is an enthralling one and is written in an entertaining style. It will be enjoyed by all who have an interest, however slight, in the vehicles which take them on their journeys for business or pleasure.

Many of the illustrations are of great historical interest, but in many cases the reproductions are too small to allow details to be studied. Apart from that small complaint, the book is excellent and its price, 12/6, is a modest one for the amount of interest and entertainment it provides.

## "TRAINS ALBUM No. 2"

E. and N.E. Regions  
(Ian Allan 1/6)

Variety is the keynote of this booklet, which comprises a series of reproductions of photographs of trains on the regions concerned. There are both new and old engines among the locomotives shown, the former including the B.R. standard 4-6-2, and the latter going back to those "old boys," the G.N. Atlantics Nos. 990 and 251, seen here on one of their joyous days out last year. Both passenger and goods trains are represented, and the characteristic lines of North Eastern and Great Central types can be seen in many of the pictures, thirty years after their original Companies passed on.

## "RACING CAR"

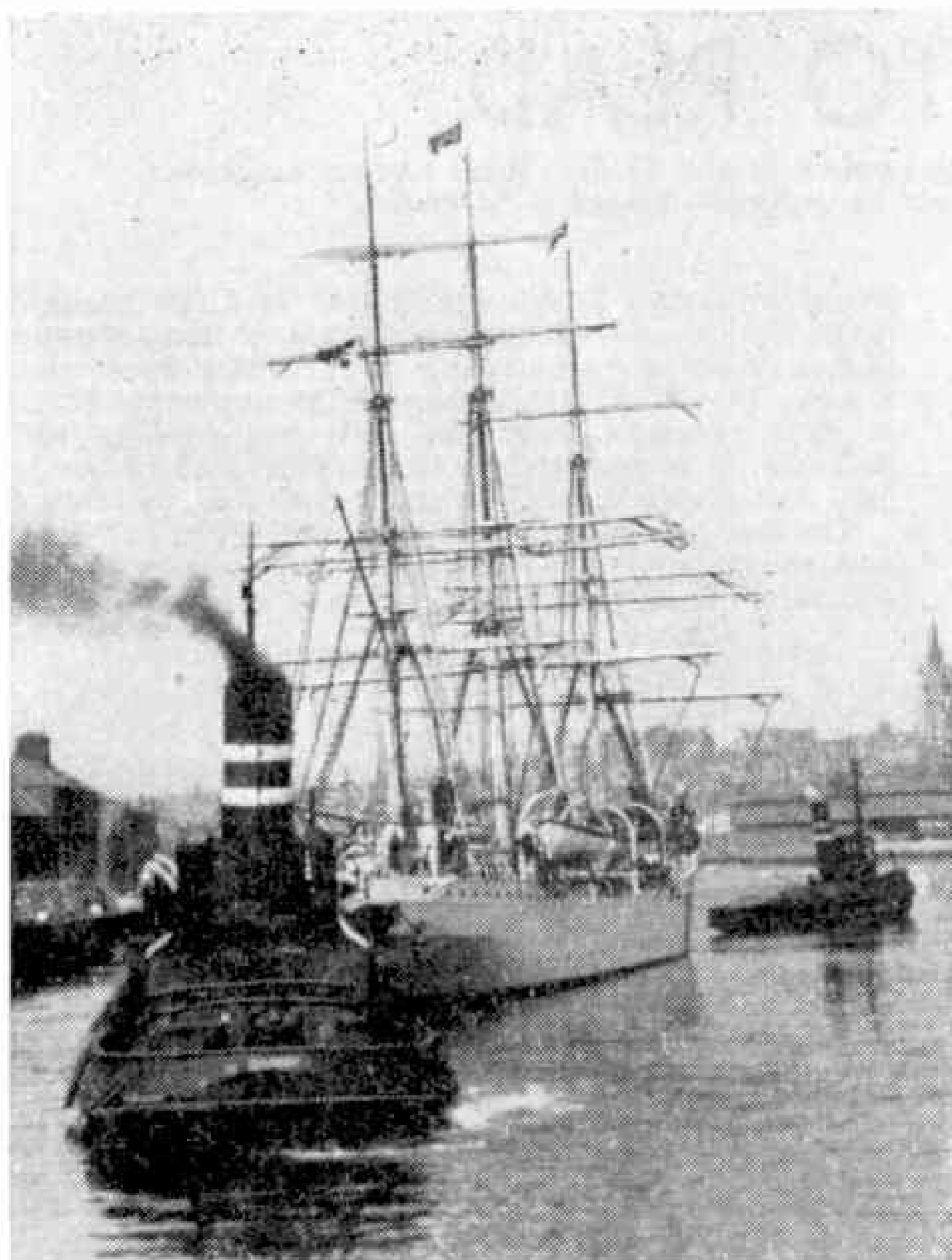
"R.M.S. 'QUEEN MARY' "

## "STAGE CIRCUS"

(Odhams Press 3/- each)

Cardboard model-building is very fascinating and readers with a liking for it, but who are not good at scale drawing, will find these attractive press-out books just what they want. In each book the parts of the model concerned are printed in colour on thick card, and already cut and creased so that they need only to be carefully pushed out of the page. When the sections of each model have been detached in this way and the model assembled, it can be made to operate by installing in it the necessary accessories contained in a small envelope attached to the inside front cover of the book.

The models are the work of a qualified architect and engineer, and when assembled look remarkably realistic. Each book has a chapter telling the story of the model.



Tugs pass hawsers aboard fore and aft in readiness for towing *Sorlandet* from Aberdeen Harbour to the open sea.

FOUR years ago, when *Pamir* and *Passat* reached these shores with their last cargoes of Australian grain, I thought that my chance of seeing a full-rigged sailing ship at sea had gone. *Pamir* and *Passat* were fine ships, huge four-masted barques, survivors of the battle between steam and

sail  
for  
cargoes  
on the  
great  
ocean  
routes  
of the  
world.

During the war I had seen sailing ships of many kinds, from graceful schooners in the Mediterranean bird-winged feluccas on the Nile and Arab dhows in the Red Sea to many a curious Chinese junk in the warm waters around Malaya. But I longed to see at close quarters one of the big square-rigged ships as I had seen them in books or as models in the museums.

To study a picture of such a ship is to marvel at the development that led from the simple square sail and solid keel of the earliest sailing vessels to the intricate rigging and graceful hull of such a beauty as *Cutty Sark*. *Cutty Sark* was a clipper ship, slender, fast and capable of carrying an

immense press of sail when the wind was fair, though even she might be held up for days on end when the wind blew from the wrong quarter. Near the Equator there was often no wind at all.

The introduction of the steam cargo vessel with its small crew and efficient engine spelled the doom of the wind ship. In vain did sailing masters endeavour to compete against steamers by having their ships built bigger and rigging them more simply and efficiently. The battle was already lost, and each year the number of sailing vessels dwindled. Now *Pamir* and *Passat* and half a dozen similar ships laid up in ports all over the world are almost the last of them, except for a few training ships such as the *Amerigo Vespucci* illustrated in the *M.M.* for November last.

Nevertheless, I have seen a sailing ship at sea and this is how it happened. In June last year I was on holiday in Aberdeenshire. One day when the weather was wet, I and other members of my family decided to visit Aberdeen itself to do some shopping. We were about to return to our farm in the hills, armed with pencils and painting boxes and the latest issue of the *M.M.*, when it was suggested that we might drive round by the harbour. Even in the rain there is always something of interest to be seen in dockland.

## A Square-Rigged Ship at Sea

### One of the Last of the Sailing Vessels

By J. F. Riley

Pick-  
ing my  
way  
be-  
tween  
stacks  
of sal-  
vaged  
timber,

and dodging lorries hurrying from the trawler berths piled high with boxes of fish, I had little time for observing the harbour itself. Then came a sudden shout, "*Daddy, there's a sailing ship!*" And there she was at the far side of the dock, a white three-masted full-rigged ship flying the Norwegian flag.

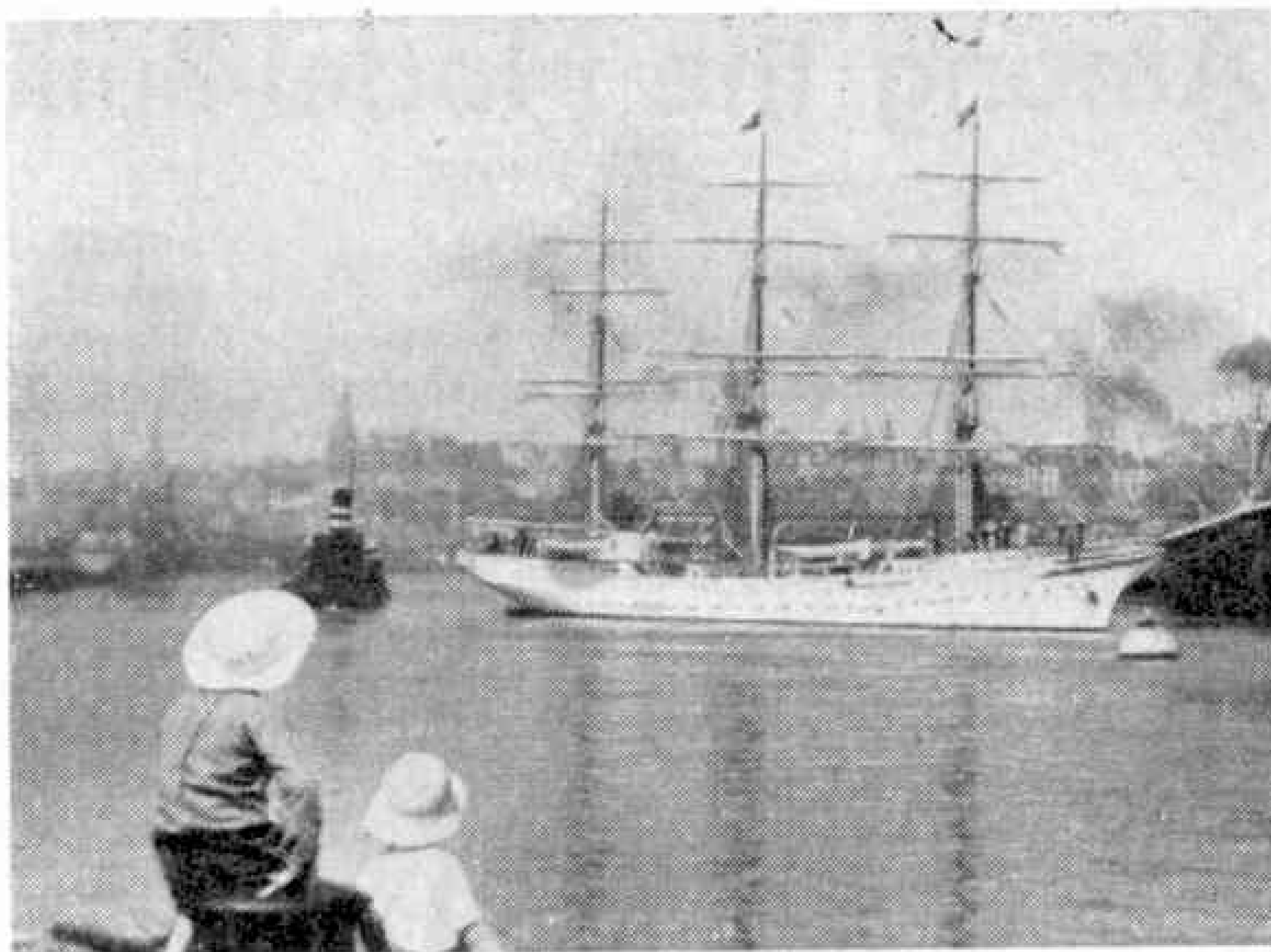
In Norway it is still necessary for a boy who wishes to make the sea his career to begin his training in sail. The Norwegian Government have three ships for this purpose and this was one of them, *Sorlandet*, a sailing vessel of 292 tons register, built by Hoivolds of Kristiansand in 1927, on a courtesy visit here.



This fine sailing ship was a centre of interest throughout her stay in harbour at Aberdeen.

During the war *Sorlandet* was sunk. She was salvaged and refitted in 1947 and now gives courses lasting five months to boys of 15-17 years who intend later to take their "tickets." When we first saw her some of her crew of 76 boys were hard at work at the capstan on the fo'cs'le head, warping the ship at her moorings. Others were busily kneading bread in the galley, while some of the smaller boys were scraping down the woodwork on deck.

Her mate told us that this was *Sorlandet's* first visit to the mainland of Scotland, though they had been to Lerwick in the Shetland islands some two years earlier. Then he turned and blew his whistle for all hands to muster in three watches amidships. After a few words of instruction in sail drill the boys sprang into the rigging like a swarm of monkeys, over the futtock-shrouds and out on to the yards, feet braced against the foot-ropes. There they hung head down as they first loosened and then tightened

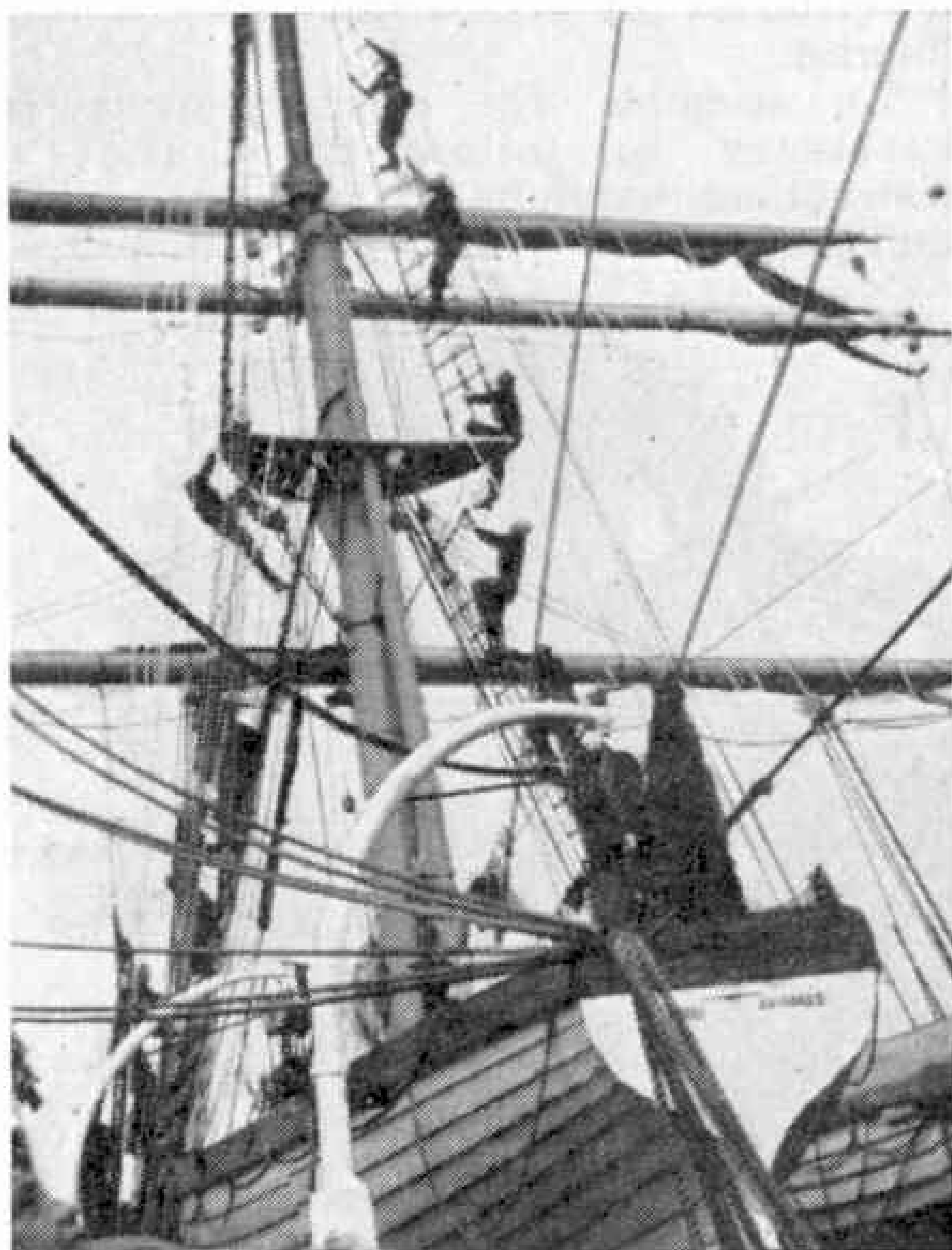


the gaskets holding the furled sails to the yards. Having completed this manoeuvre some of the bolder spirits slid straight down the backstays to the deck. A happier or more healthy crew could not be imagined.

Looking at these young Vikings one could but regret that we in this country no longer train our boys in sail. For the sea is Britain's history; and from the time of Drake to the miracle of Dunkirk we have had good reason to be proud of the men of the little ships. I tried to explain something of my thoughts to one of the crew, but he understood no English.

We visited *Sorlandet* again the day she sailed, a glorious day of wind and sun. Since she carries no auxiliary engine, two ocean-going tugs passed their hawsers aboard fore and aft to guide her slowly through the dock gates towards the open sea. What a picture she made with her graceful white hull and towering masts of yellow pine! After watching her leave her moorings we raced out to the headland at Girdleness, where scores of schoolchildren had gathered to give her a final cheer.

As she passed the lighthouse the tug astern cast off and swept round her, wishing her well. Then in the heat haze far out at sea we saw the cutter go alongside to take off the pilot. The remaining tug cast off and once again we saw the familiar specks mounting the rigging. At first the sails hung dark against the sun, turning gleaming white as they were sheeted home and the yards were braced to catch the wind. Gracefully then *Sorlandet* heeled over to the favouring breeze and was soon hull-down on the horizon on her way home.



Sail drill on the *Sorlandet*. The boys who man her going aloft.

# Among the Model-Builders

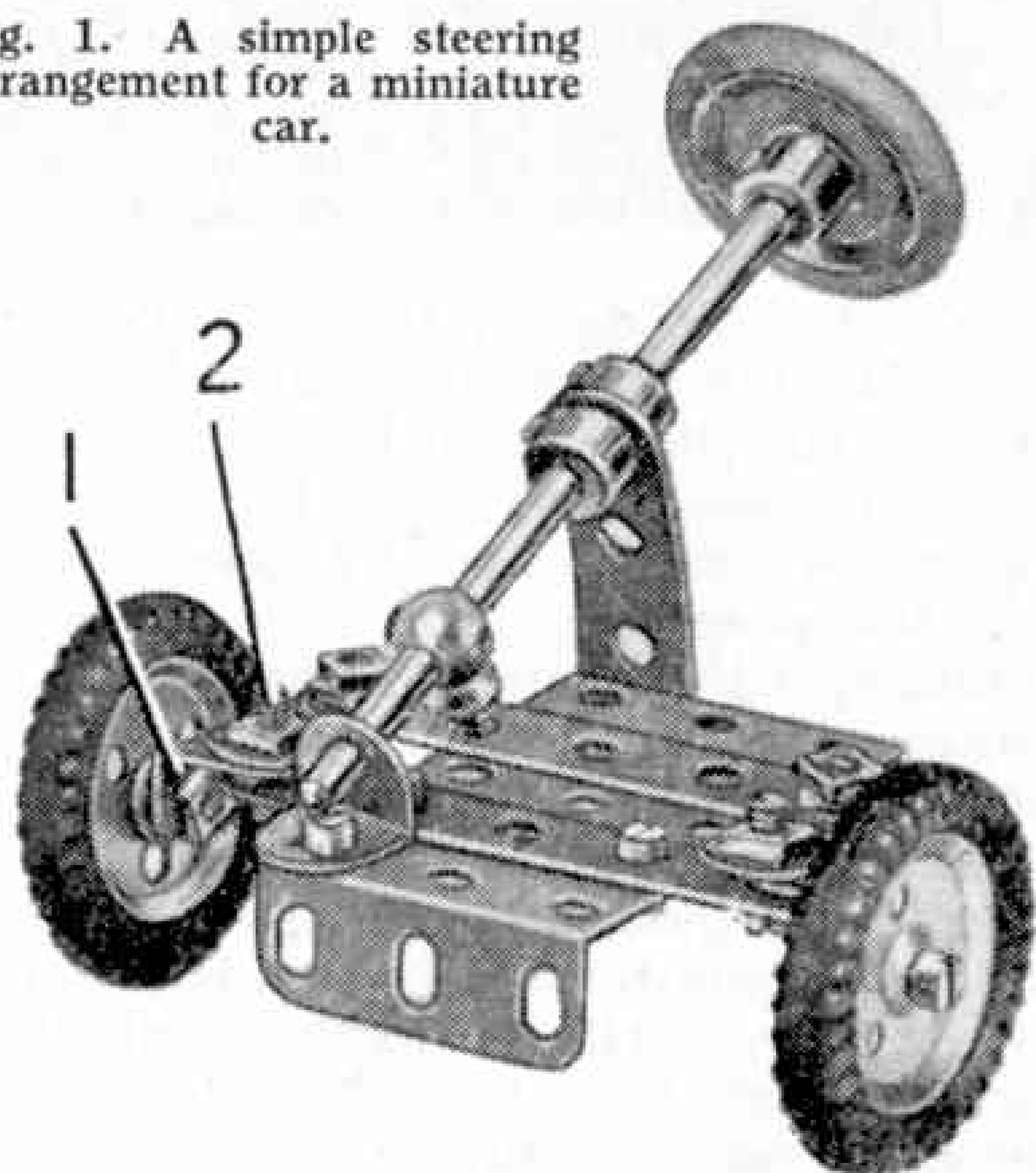
By "Spanner"

## Steering Gear for a Small Car

Fig. 1 shows one of the more simple types of steering gear that can be assembled from Meccano parts, and it is particularly suitable for use in a miniature car.

Each of the road wheels rotates on a stub axle consisting of a  $\frac{1}{2}$ " Bolt fastened to an Angle Bracket 1. A  $\frac{3}{8}$ " Bolt 2 passes through the end hole of a  $2\frac{1}{2}$ " Strip that

Fig. 1. A simple steering arrangement for a miniature car.



represents the axle beam, and the Angle Bracket 1 and a Fishplate are secured to the Bolt by two nuts. The track rod consists of a second  $2\frac{1}{2}$ " Strip, which is lock-nutted to the Fishplates.

A Handrail Support is locked on the steering column, in such a position that its shank engages one of the holes in the Strip forming the track rod.

## Free-Wheel Mechanism

From one of my correspondents I have received details of a simple free-wheel mechanism that uses Spring Clips as the ratchet pawls. Unfortunately my correspondent's address has been mislaid, but the mechanism is illustrated in Fig. 2. I hope that if the designer sees it he will get in touch with me, so that I can make the usual acknowledgment of his contribution. It will be seen that the driving gear is a 57-tooth Gear 1. This is freely mounted on a Rod fitted with a  $\frac{1}{2}$ " Pinion 2, which is fixed on the Rod by its grub screw. Each of the pawls is a

Spring Clip 3 placed between Washers on a Pivot Bolt. The Pivot Bolt is held by its nuts in a hole in the Gear 1. One lug of the Spring Clip engages the teeth of the Pinion 2, and the other lug bears against a Collar 4. The Collar is attached to the Gear 1 by a  $\frac{1}{2}$ " Bolt, and is spaced from the Gear by three Washers on the Bolt.

## A Novel Differential Gear

A good example of the way in which standard Meccano parts can be fitted together to form unusual designs is shown in the novel differential illustrated in Fig. 3. This was submitted by N. Gottlob, Hjortekaer, Denmark, and although it is too large to be widely adaptable it is nevertheless of considerable mechanical interest.

To assemble the mechanism it is necessary to follow the builder's instructions carefully in order to avoid difficulty.

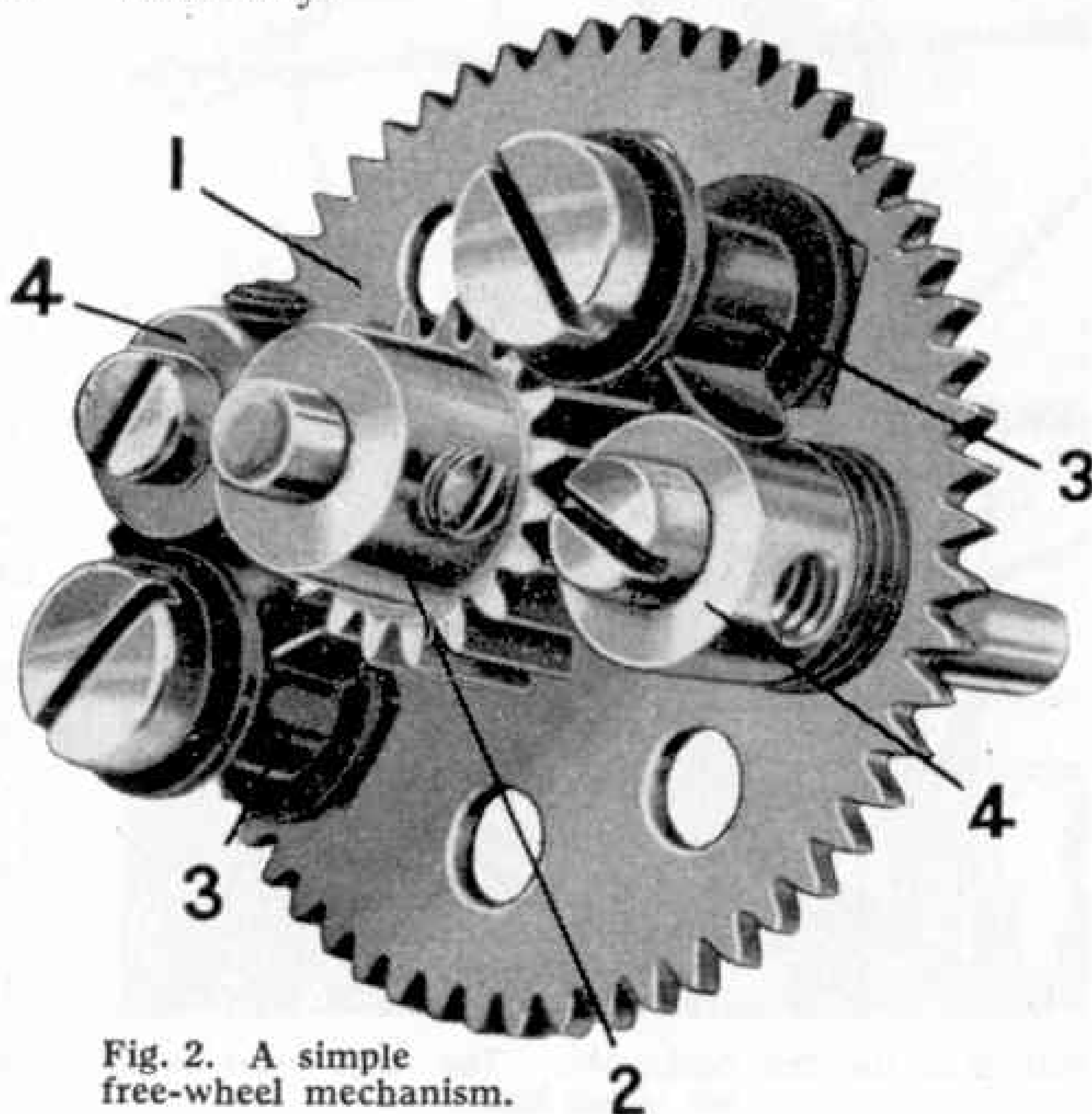


Fig. 2. A simple free-wheel mechanism.



R. E. Moutray, Dungarvan, Co. Waterford, Eire, whose mechanical accelerator is referred to on the opposite page.



In the centre transverse bore of a Coupling 5 a 2" Rod is inserted, and Washers and Pinions 2 are fitted on the Rod as shown. The Pinions are free to turn on the Rod. Now one of the End Bearings 9 is slid on to the Rod and the

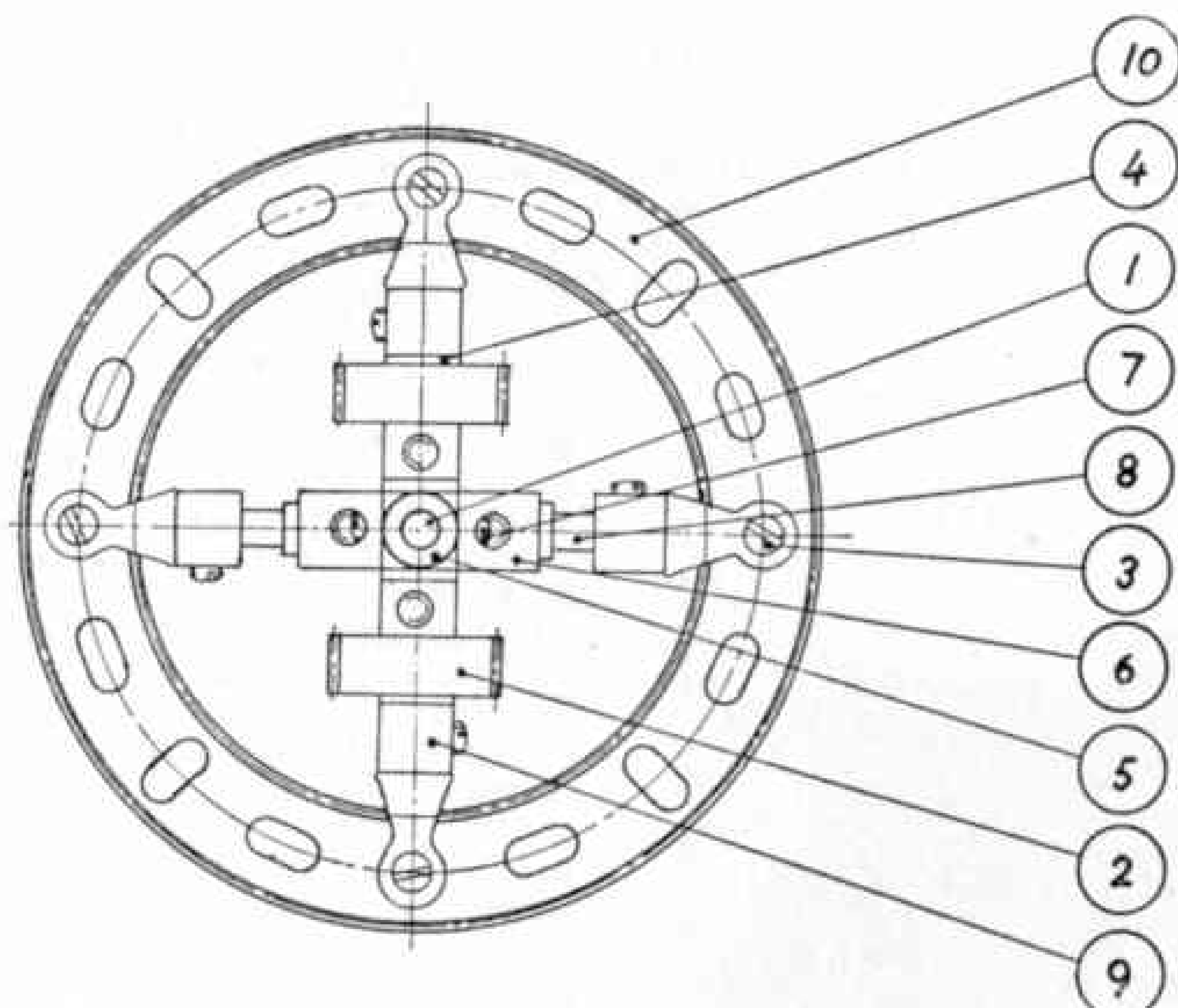


Fig. 3. This differential gear is of unusual design. It is the work of N. Gottlob, Hjortekaer, Denmark.

assembly is inserted into a Gear Ring 10 by passing this in between the lugs of the End Bearing. The opposite End Bearing is then fitted, by first slipping the lugs over the Gear Ring and afterwards inserting the 2" Rod into its boss. This requires a little manipulation, but it can be done.

The 2" Rod is clamped in the Coupling by means of two 7/32" Grub Screws, and the End Bearings are also secured to the Rod, but the Pinions must be allowed to turn freely. Two Threaded Bosses 6 are screwed to each of the Grub Screws and firmly locked against the Coupling. A third End Bearing, with a Threaded Pin 8 loosely inserted in its boss, is slipped over the Gear Ring, and the threaded shank of the Pin is screwed into a Threaded Boss. The fourth End Bearing is fitted in the same manner. Now the centre cross is complete, and finally the End Bearings are fixed to the Gear Ring by means of nuts and

bolts and the two last mounted End Bearings are clamped to the Threaded Pins.

Before assembling the differential, it should be decided by arranging the Washers and Pinions on the 2" Rod properly, whether they shall be used in connection with a 1½" or ¾" Contrate Wheel. The ends of two suitable Rods carrying either of these Contrates are inserted in the Coupling.

### A Friction Drive Mechanical Accelerator

R. E. Moutray, Dungarvan, Co. Waterford, sent a sketch of an accelerator device which can be used to vary the speed of a driven shaft. It consists of a driving plate formed by a Circular Plate, and against this bears a 1" Pulley fitted with a Motor Tyre that is fixed on a Rod free to slide endways in its bearings. The sliding Rod carries a wide face pinion formed by two ½" × ¾" Pinions placed end to end, and this engages a ½" Pinion on a Rod mounted parallel to the sliding Rod. By sliding the 1" Pulley across the face of the Circular Plate, the speed of the drive to the shaft carrying the ½" Pinion can be varied as desired.

### MORE PRIZES FOR MODEL-BUILDERS

We wish to remind readers that the "Winter" Model-Building Competition is open for entries until the end of this month.

Models of any kind or size are eligible for entry in this Competition and it is open to model-builders of all ages, living in the British Isles or Overseas. There will be two Sections, A, for competitors under 14 years of age and B, for competitors over 14 years of age.

It is not necessary to send the actual model. A photograph or a good sketch is all that is required, and this should be forwarded to "Winter Model-Building Competition, Meccano Ltd., Binns Road, Liverpool 13."

The following Prizes will be awarded in each Section of the Competition. First, Cheque for £4/4/-. Second, Cheque for £2/2/-. Third, Cheque for £1/1/-. Ten Prizes each of 10/-. Ten Prizes each of 5/-. A number of Certificates of Merit will also be awarded.

Entries may be sent in up to 30th April.

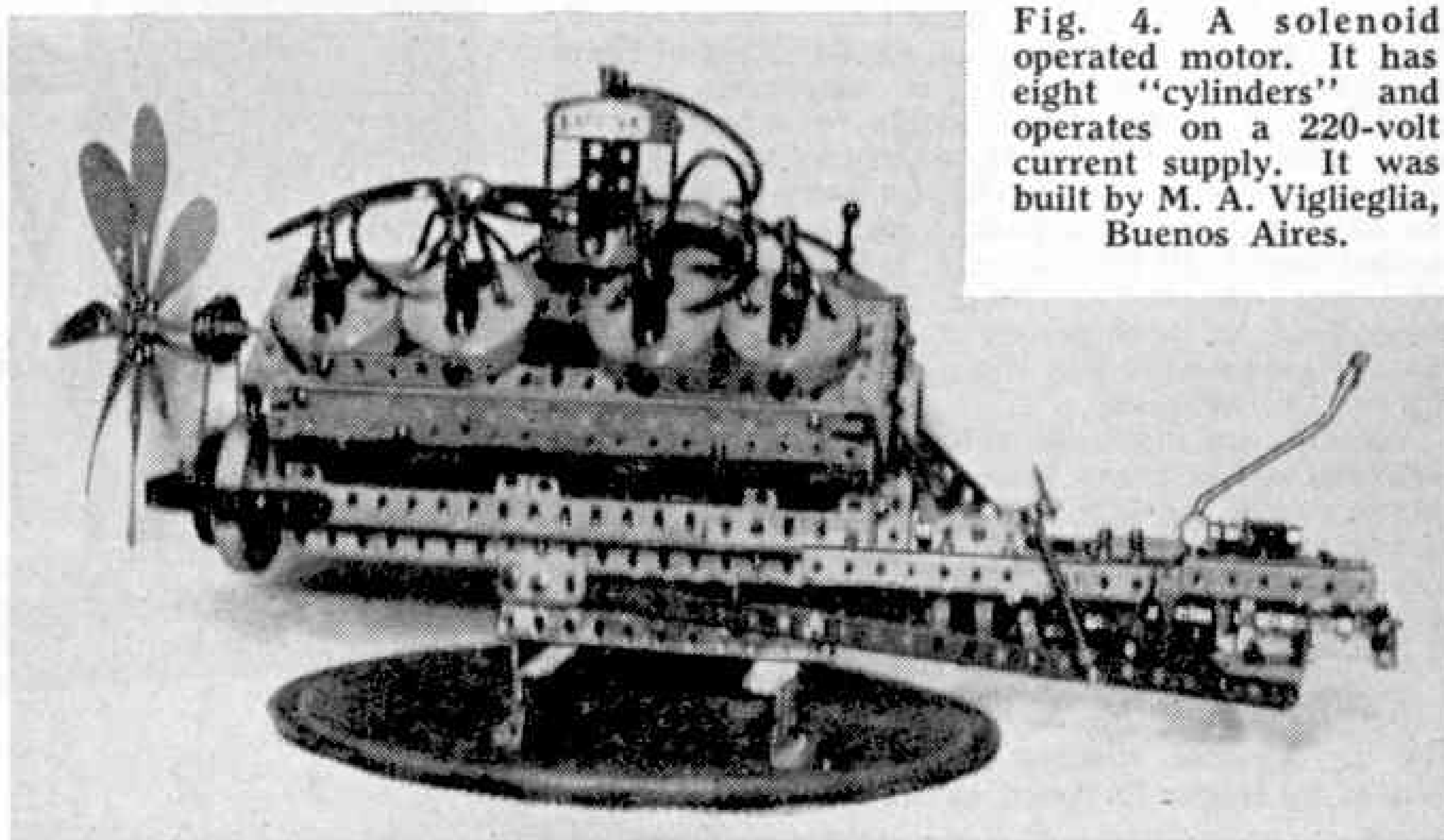


Fig. 4. A solenoid operated motor. It has eight "cylinders" and operates on a 220-volt current supply. It was built by M. A. Vigliaglia, Buenos Aires.

# The International Model-Building Competition

## Originality and Imagination Earn Prizes

By "Spanner"

ONE of the most pleasing points about the entries received for the International Model-Building Competition is the originality displayed by competitors in choosing the subjects for their models. Particular reference was made to this point in the leaflet setting out the conditions of the Competition, and each month, as I examine the prize-winning entries to

constructional treatment that made them stand out from other entries in the same class.

An example of this is the motor car built by Master T. J. B. Harris, London S.W.5, which is shown in Fig. 1. Harris has gone back many years to find the prototype for his model, for it is based on a Rolls Royce car produced in 1905! The car is driven by a 20-volt

Electric Motor, and is equipped with a three-speed gear-box and differential gear. Internal expanding brakes are fitted to the rear wheels. Harris has paid great attention to detail work on his model, and has successfully captured the appearance and general "character" of a veteran motor car by his skilful use of parts. The oil lamps fitted to the model are especially noteworthy. Each is made from a  $\frac{1}{4}$ " Flanged Wheel, a Chimney Adaptor, a  $\frac{1}{2}$ " Pulley and a Collar.

Another model of an unusual type is the wool winding machine seen in Fig. 2. This was entered in Section B by Master R. Luttmer, Wookey Hole, Somerset, and is the result of a good deal of careful thought and development. Actually

Luttmer built three machines on similar lines, but incorporated in each one improvements and

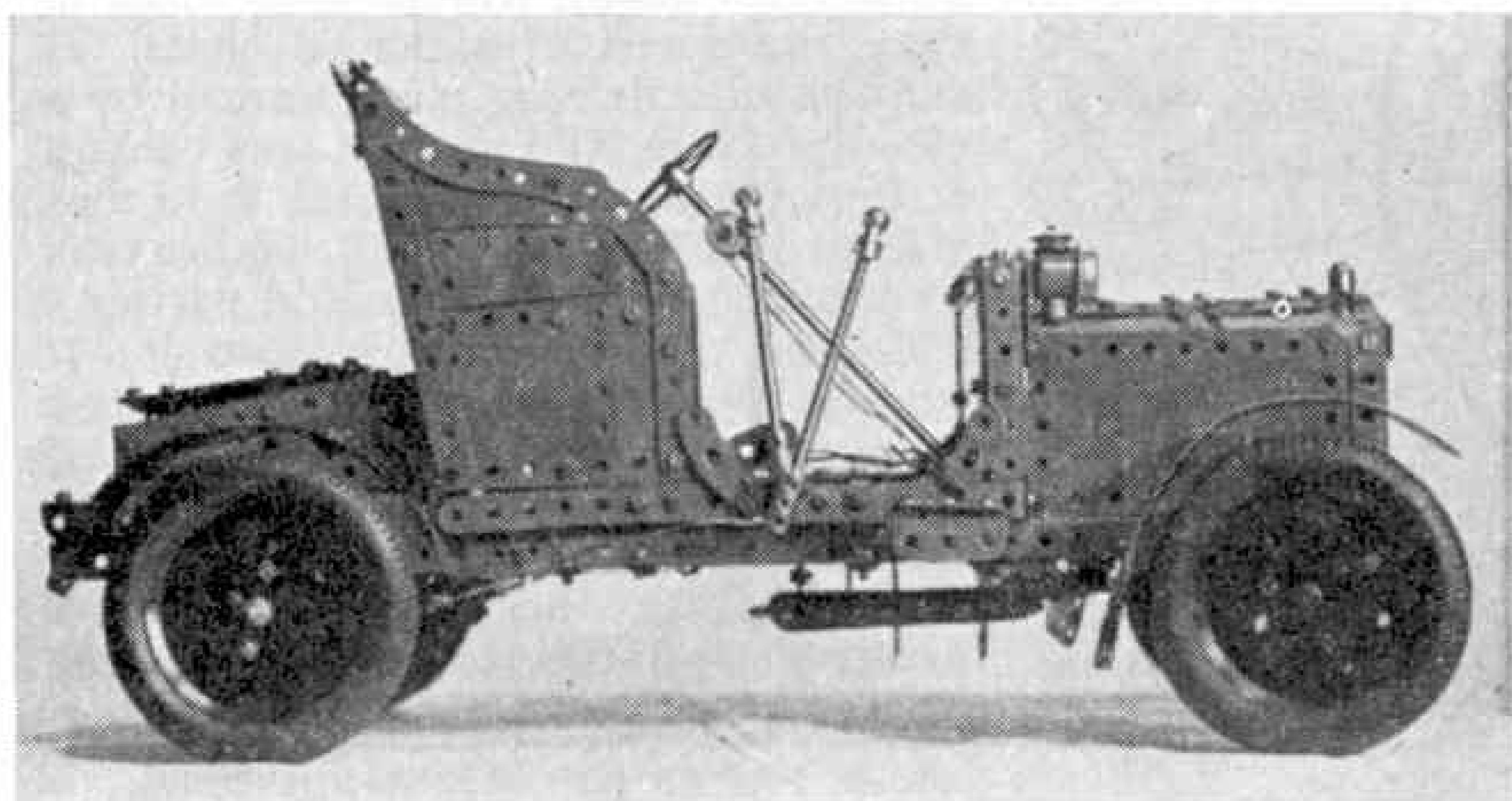


Fig. 1. A 1905 Rolls Royce reproduced in Meccano by T. J. Britton Harris, London S.W.5.

make a selection for these pages, I am more and more impressed by the amazing variety of the subjects covered by the entries.

The selection of models I have chosen this month illustrates this point particularly well. They are all attractive models, as were most of the entries received, but in addition each of them has some feature in the choice of subject or in design that earned high marks for originality.

In most cases the models are based on unusual subjects, but it is not always essential to choose a really original model. Very often imaginative treatment of an otherwise ordinary subject will catch the judges' attention, as in the case of the breakdown lorry and car shown in Fig. 3. This is a good example to illustrate my point, for although both models are well designed and constructed, there is nothing really original about either of them by itself. The originality is displayed in the combination of the two models to represent the scene after a road accident, when the wreckage has been cleared and the breakdown lorry is removing the damaged car to a garage for overhaul. These models were built by Master A. Wills, Southampton, who was awarded a Prize in Section B. The breakdown lorry is driven by a No. 1 Clockwork Motor, and is equipped with a simple but effective steering mechanism.

Vehicles are favourite subjects for many model-builders, and in every Meccano Competition a large proportion of the entries is based on cars and lorries of various kinds. The International Competition was no exception, but many of the vehicles had something extra in the choice of subject or in the

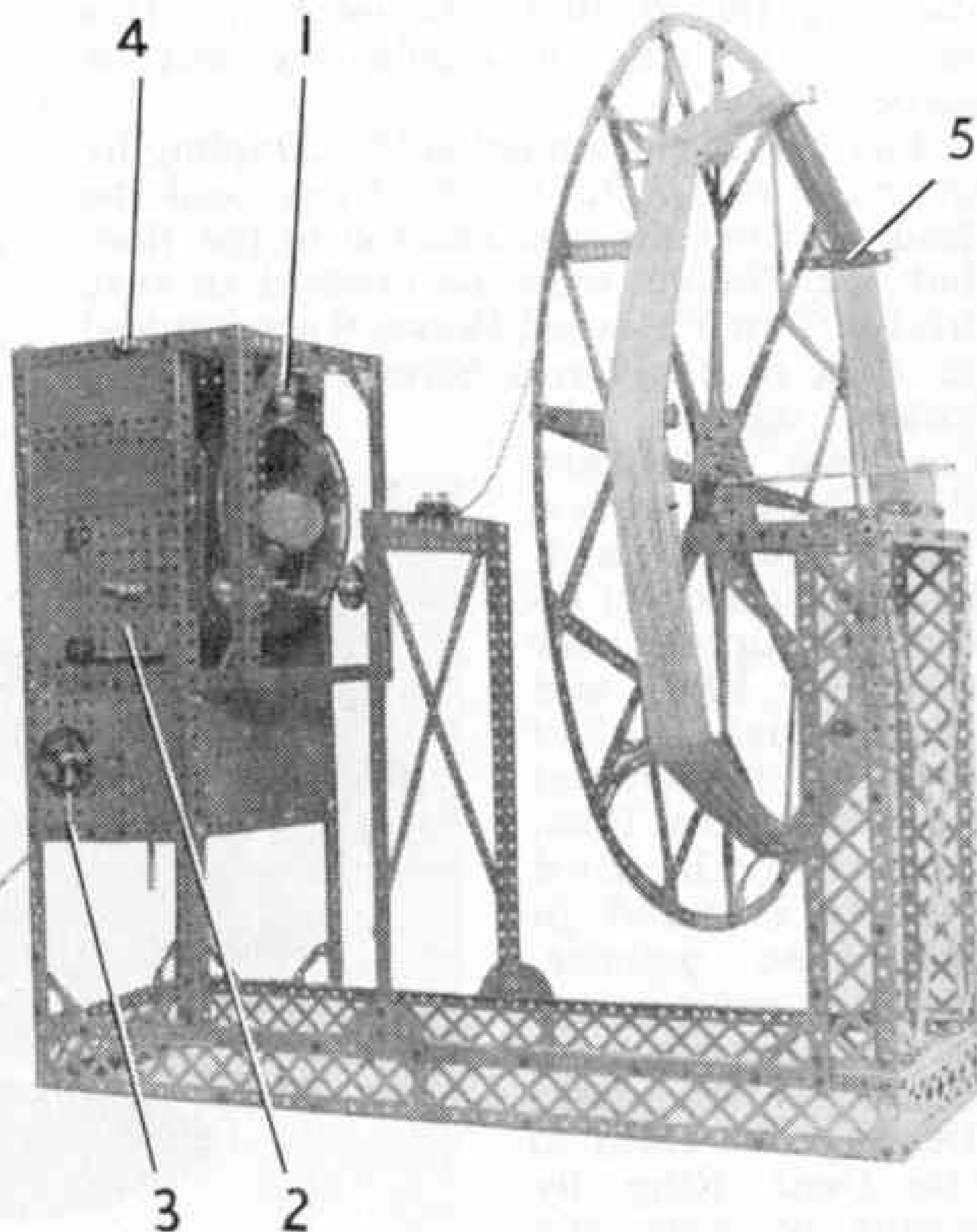


Fig. 2. A wool winding machine of a new type devised by Roger Luttmer, Wookey Hole, Somerset.



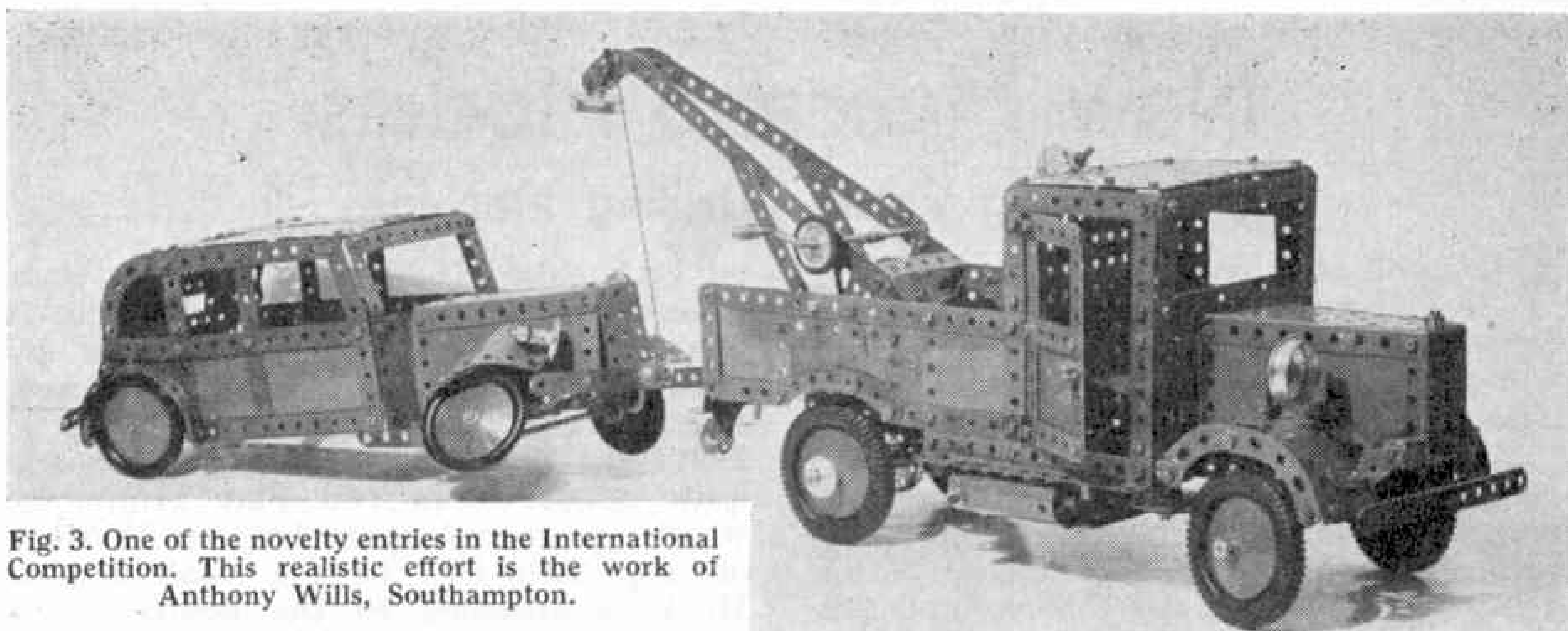


Fig. 3. One of the novelty entries in the International Competition. This realistic effort is the work of Anthony Wills, Southampton.

developments until he obtained the efficient model he entered for the Competition. The final version of the machine will wind a complete skein into a neat ball in less than a minute. All the movements of the model are operated by an E020 Electric Motor.

The model shown in Fig. 4 was built by Mr. A. Eyre, Sheffield 2, and gained for its builder a prize in Section C of the Competition. This well planned model is based on a plant used for processing cattle feeding meal into cubes. The process is started by feeding the meal into an elevator conveyor, which delivers it into the mixing drum at the extreme left of the picture. In this drum is a spiral mixing blade, and the mixed material is then transferred to a compensating bin and into a cubing press. The pressed cubes are passed into a cooling chamber for delivery through chutes ready for packing. A high speed fan draws air through the cooling chamber

from lengths of binding tape about  $\frac{1}{2}$ " wide. The ends of each length of tape are joined by a short piece of broad elastic, to make an endless belt that can be stretched over the conveyor rollers. The rollers consist of Couplings fixed to short Rods.

#### OCTOBER MODEL-BUILDING COMPETITION

The full lists of awards in the two Sections of the "October General Model-Building Competition" are as follows:

##### Section A. (Competitors under 14 years of age).

First Prize, Cheque for £5: D. L. Southern, Reading.  
Second Prize, Cheque for £3: A. E. Knowler, Plymouth.  
Third Prize, Cheque for £2: R. Matthews, Sutton Coldfield.

##### Ten Consolation Prizes of £1:

A. Richardson, Newcastle-upon-Tyne 3; D. Walters, Buckfastleigh; P. Charon, Grivegnie, Belgium; M. Pomeroy, Shoreham-by-Sea; R. Schulze and P. Attfield, Pretoria, South Africa; I. R. Patterson, Chester le Street; S. McKinnon, Rutherglen; M. Sher, Johannesburg, South Africa; B. Gilson, Codsall; P. N. Denbigh, Cambridge.

##### Ten Consolation Prizes of 5/-:

L. Copithorne, Cochrane, Canada; R. Courtier, London N.W.7; D. Guyton, Deal; D. Gaff, Guildford; J. D. Moore, Southampton; D. J. Evans, London E.4; R. Penney, Belfast; D. G. Ainger, London N.14; J. Calver, Newcastle-upon-Tyne 4; Miss S. Weldon, Castleroy, Eire.

##### Section B. (Competitors over 14 years of age).

First Prize, Cheque for £5: H. F. Gibbs, Liverpool 19. Second Prize, Cheque for £3: H. W. Henry, Rochester. Third Prize, Cheque for £2: H. Marmignon, Gembloux, Belgium.

##### Ten Consolation Prizes of £1:

H. Haywood, Sheffield 3; E. P. Miquel, Barcelona, Spain; H. H. Taylor, Huddersfield; J. B. Wright, London N.20; B. D. Baxter,

Whangarei, New Zealand; N. C. Edwards, Liskeard; Major D. F. Densham-Booth, Newton Abbot; K. A. Siddons, Woodbridge; B. W. Rowe, Buckfastleigh; P. Lewis, Bridlington.

Ten Prizes of 5/-: Dr. K. W. Cameron, Ary, U.S.A.; H. Smith, Kensington, South Africa; M. G. Rogers, Yeovil; D. C. Mead, Stoke; W. R. Dannatt, Weston-super-Mare; I. J. F. Da Cruz, Bombay; E. Bunch-Oleson, Vejle, Denmark; R. J. Hilling, Ipswich; J. C. Robert, Santiago; H. J. Halliday, London S.E.15.

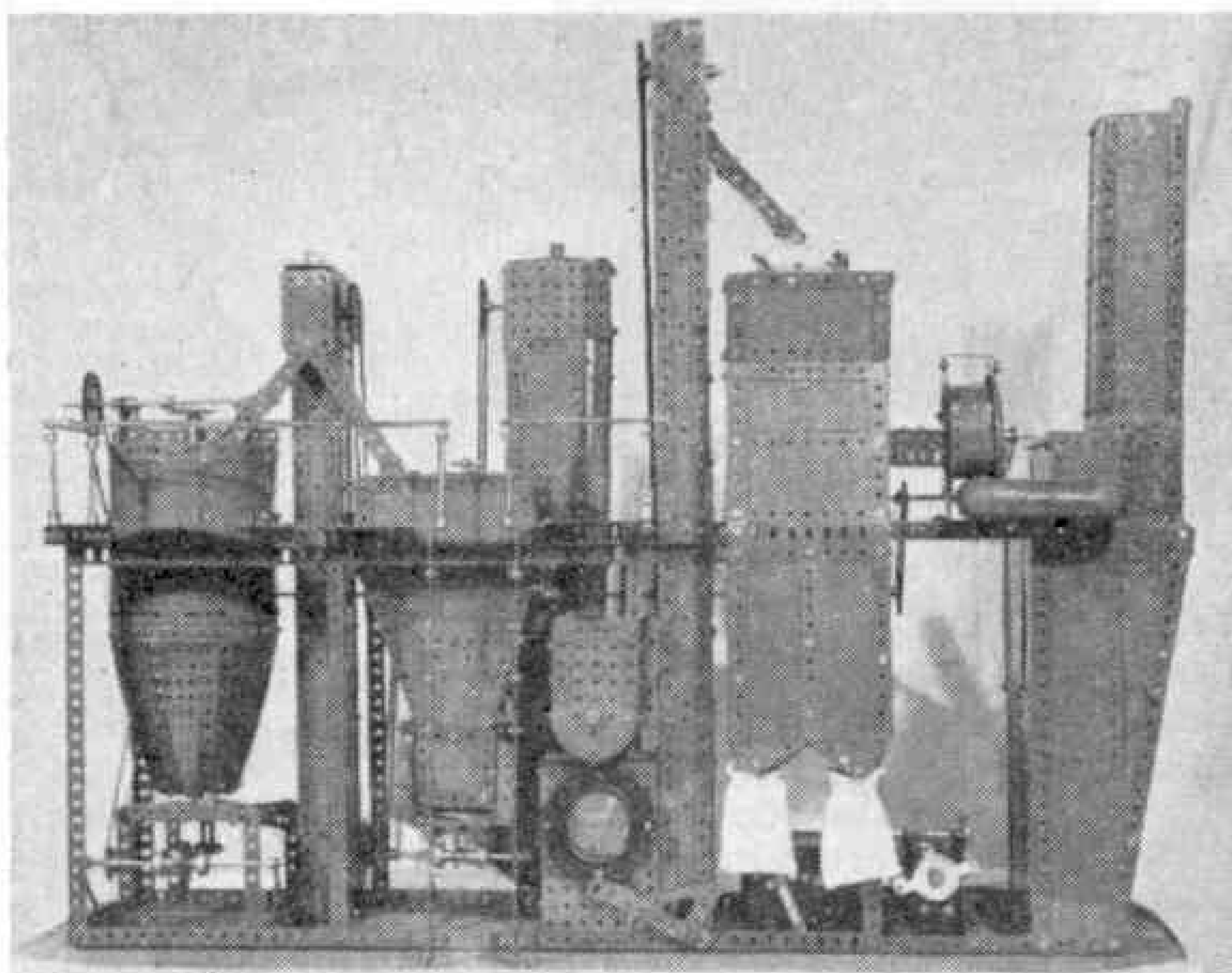


Fig. 4. A. Eyre, Sheffield 2, won a prize with this well-built model of a plant used for making oil cakes for cattle feed.

and extracts any dust that may be present into a dust chamber at the right-hand end of the model. The elevators and other working parts of the model are driven by an E20R Electric Motor, which is bolted to the base and operates the various mechanisms through suitable reduction gearing. The current supply is obtained through a Transformer fixed alongside the Motor so that the model is self-contained and can be set working simply by connecting the Transformer to the mains supply. The elevator conveyors are made

# New Meccano Models

## Travelling Crane—Drilling Machine

**Y**OU will need only the parts contained in Outfit No. 1 to build the attractive travelling crane shown in Fig. 1, and it will certainly prove an interesting subject, especially if you have only a small Outfit.

It is best to commence building it by passing two  $3\frac{1}{2}$ " Rods through the side flanges of a Flanged Plate and then fitting each Rod with two 1" Pulleys. Motor Tyres are placed on the Pulleys, and this section of the model is then complete and forms the travelling base for the crane.

Now you can commence work on the crane itself. First make the base of the cab, which is built up on a Bush Wheel, which has a 2" Rod held in its boss. This Rod has to be passed through the centre hole of the Flanged Plate, and also through a lug of a  $\frac{1}{2}$ " Reversed Angle Bracket, which you must bolt underneath the Plate. The Rod is then held in position by placing a Spring Clip on it up against the Reversed Angle Bracket.

Now you should bolt two  $2\frac{1}{2}$ " Strips across the Bush Wheel, and to the ends of these Strips fix two  $2\frac{1}{2}" \times \frac{1}{2}"$  Double Angle Strips. One of the Double Angle Strips is indicated at (1), and the other is held by a bolt (2) on each side. The lugs of the Double Angle Strips are then connected by  $2\frac{1}{2}"$  Strips (3). The crane cab is made from two  $5\frac{1}{2}" \times 1\frac{1}{2}"$  Flexible Plates curved as shown and bolted together, and then attached to the rear ends of the Strips (3).

The crane jib is formed by two  $5\frac{1}{2}"$  Strips

on each side. These are bolted at their lower ends to the Strips (3). The jib is lengthened and shaped at the top by means of two  $2\frac{1}{2}"$  Stepped Curved Strips, which are connected together by a  $\frac{3}{8}"$  Bolt (4). The pulley block (5) is made quite simply from two Flat Trunnions, which are spaced apart by four Washers on a  $\frac{3}{8}"$  Bolt (6). Then a small Loaded Hook is attached to the pointed ends of the Trunnions by another  $\frac{3}{8}"$  Bolt.

The operating Crank Handle (7), which as you can see is supported at the rear of the cab, is held in place by Spring Clips. Tie a length of Cord to the Crank

Handle, pass it over the Bolt (4) and round the Bolt (6) and then fasten it to the top of the jib.

You will require the following parts to build the Travelling Crane:

4 of No. 2; 4 of No. 5; 2 of No. 16; 1 of No. 17; 1 of No. 19s; 4 of No. 22; 1 of No. 24; 3 of No. 35; 26 of No. 37a, 22 of No. 37b; 4 of No. 38; 1 of No. 40; 2 of No. 48a; 1 of No. 52; 1 of No. 57c; 2 of No. 90a; 3 of No. 111c; 1 of No. 125; 2 of No. 126a; 4 of No. 142c; 2 of No. 189.

### A Drilling Machine for Outfit No. 2

The second model this month represents a vertical drilling machine of the type used in most engineering workshops. It can be built from the parts in Outfit No. 2.

For the base of the machine a  $5\frac{1}{2}" \times 2\frac{1}{2}"$  Flanged Plate is used, and to it are bolted two Trunnions (1), each fitted with a  $2\frac{1}{2}"$  Strip. Fix an Angle Bracket to the top of each Strip to support the drill table (2), which you can make from a  $2\frac{1}{2}" \times 2\frac{1}{2}"$  Flexible Plate edged by two  $2\frac{1}{2}"$  Strips and two  $2\frac{1}{2}"$  Stepped Curved Strips. The bolts you use to fix the table to the Angle Brackets are used also to support two

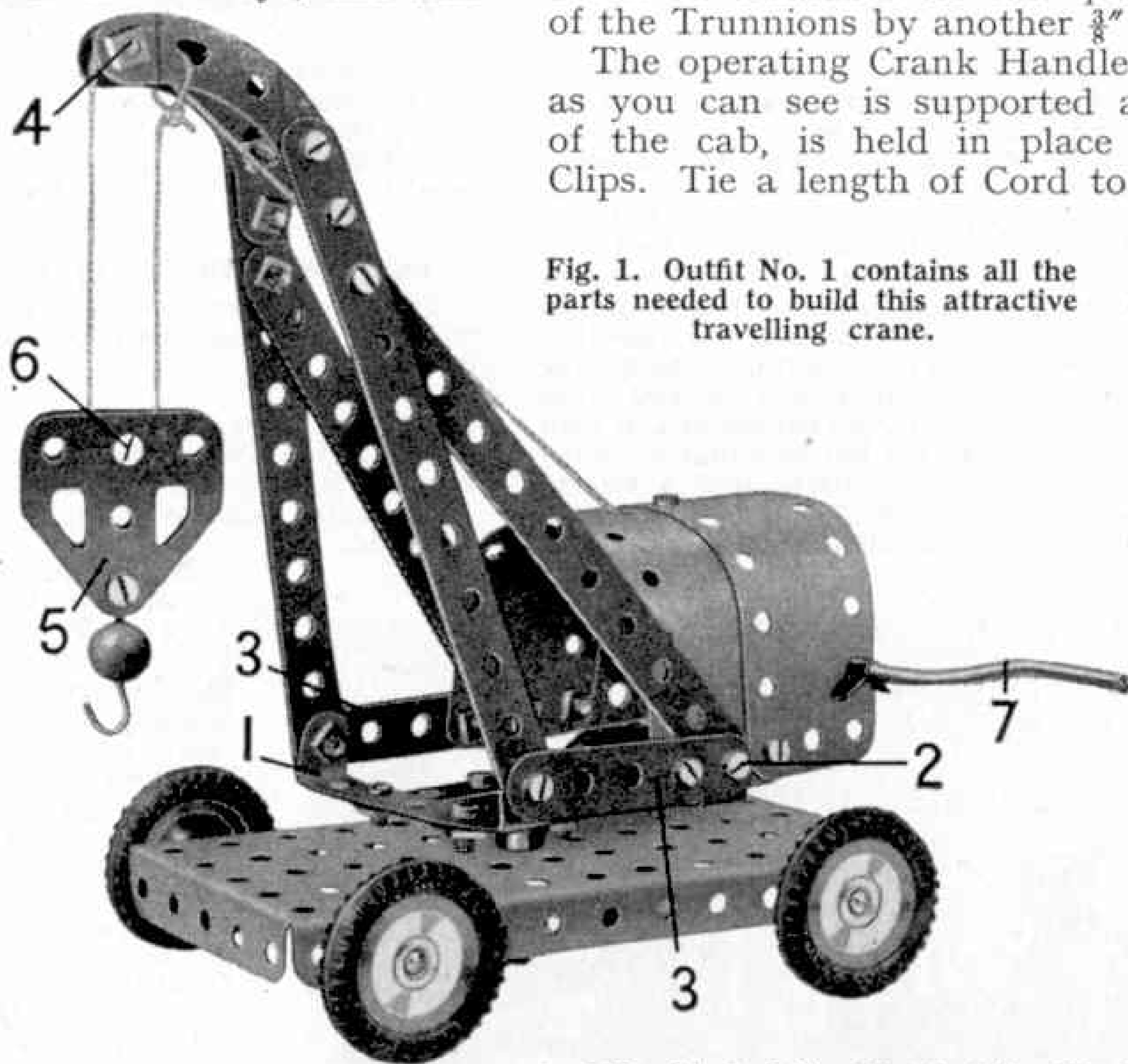


Fig. 1. Outfit No. 1 contains all the parts needed to build this attractive travelling crane.



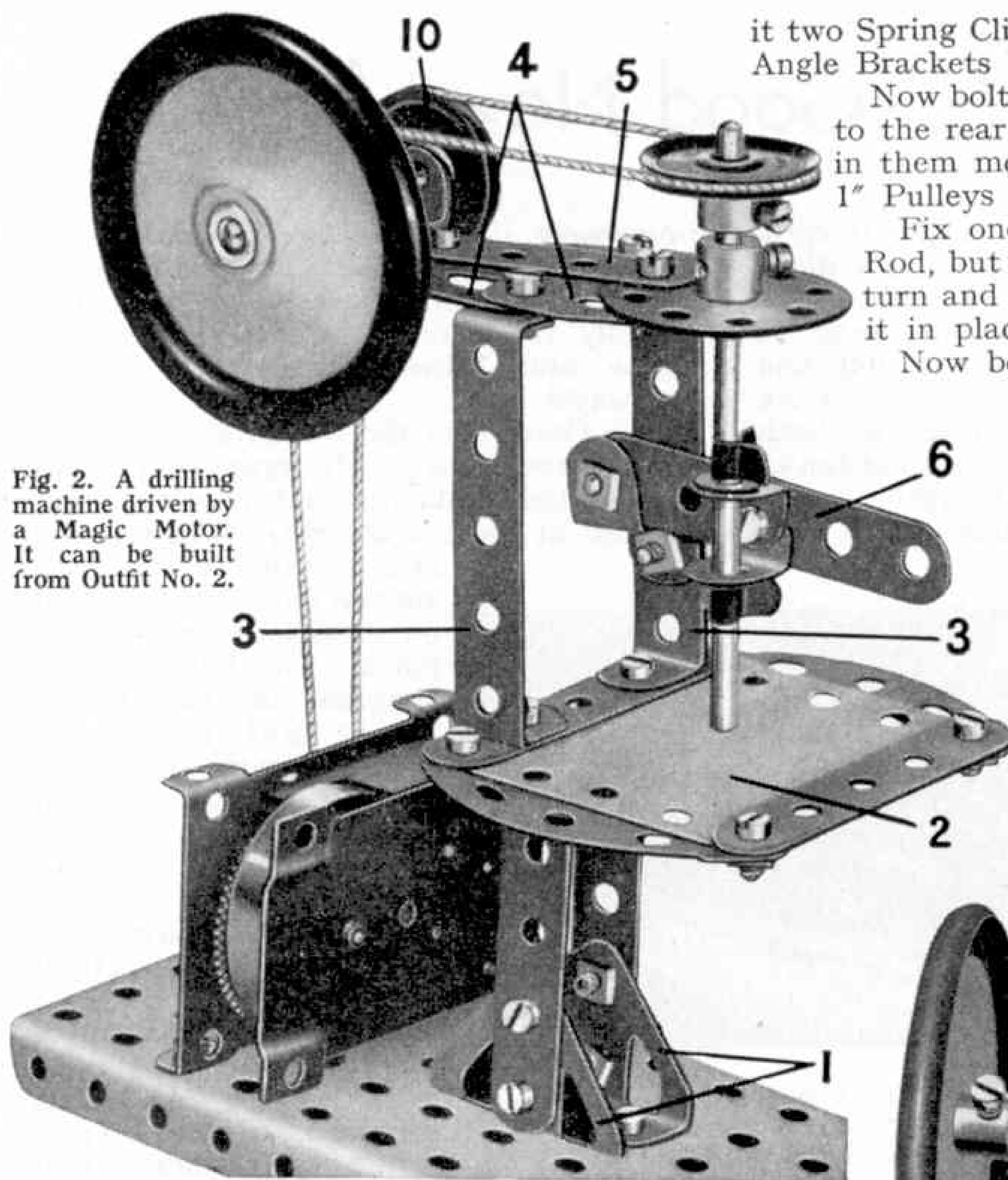


Fig. 2. A drilling machine driven by a Magic Motor. It can be built from Outfit No. 2.

it two Spring Clips spaced from each of the Angle Brackets by a Washer.

Now bolt two Angle Brackets firmly to the rear end of the Strip (5), and in them mount a 2" Rod fitted with 1" Pulleys (10).

Fix one of these Pulleys on the Rod, but leave the other one free to turn and use a Road Wheel to hold it in place.

Now bolt a *Magic* Motor to the rear of the base as shown in Fig. 2. Pass a length of Cord round the Motor pulley, over the Pulleys 10 and round the 1" Pulley at the top end of the drill shaft. Then tie the ends of the Cord together.

The only parts you will need to build the Drilling Machine are: 6 of No. 5; 6 of No. 12; 1 of No. 16; 1 of No. 17; 3 of No. 22; 1 of No. 24; 2 of No. 35; 27 of No. 37a; 22 of No. 37b; 2 of No. 38; 1 of No. 40; 2 of No. 48a; 2 of No. 90a; 1 of No. 111c; 1 of No. 125; 2 of No. 126; 2 of No. 126a; 1 of No. 187; 1 of No. 190; 1 *Magic* Clock-work Motor.

2½" × ½" Double Angle Strips (3), which are connected at their upper ends by two Flat Trunnions (4). Now bolt a 2½" Strip (5) to the Flat Trunnions.

The drill shaft is a 3½" Rod, and it is free to turn in the boss of a Bush Wheel bolted to the Strip (5). The boss of the Bush Wheel is placed over the hole at the pointed end of one of the Flat Trunnions (4). For the purpose of raising and lowering the drill spindle a lever marked (6) is provided. This lever is a 2½" Strip and it is *lock-nutted* to the ½" Reversed Angle Bracket marked (7), which is bolted to one of the Double Angle Strips (3). Now bolt two Angle Brackets tightly together by a nut on a ⅜" Bolt. These are numbered 8 in Fig. 3. Pass the ⅜" Bolt through the centre hole of the lever (6) and fit it with *lock-nuts*. Make sure that the Bolt is able to pivot freely. Then pass the drill shaft through the slotted holes of the Angle Brackets (8), and prevent it from sliding by placing on

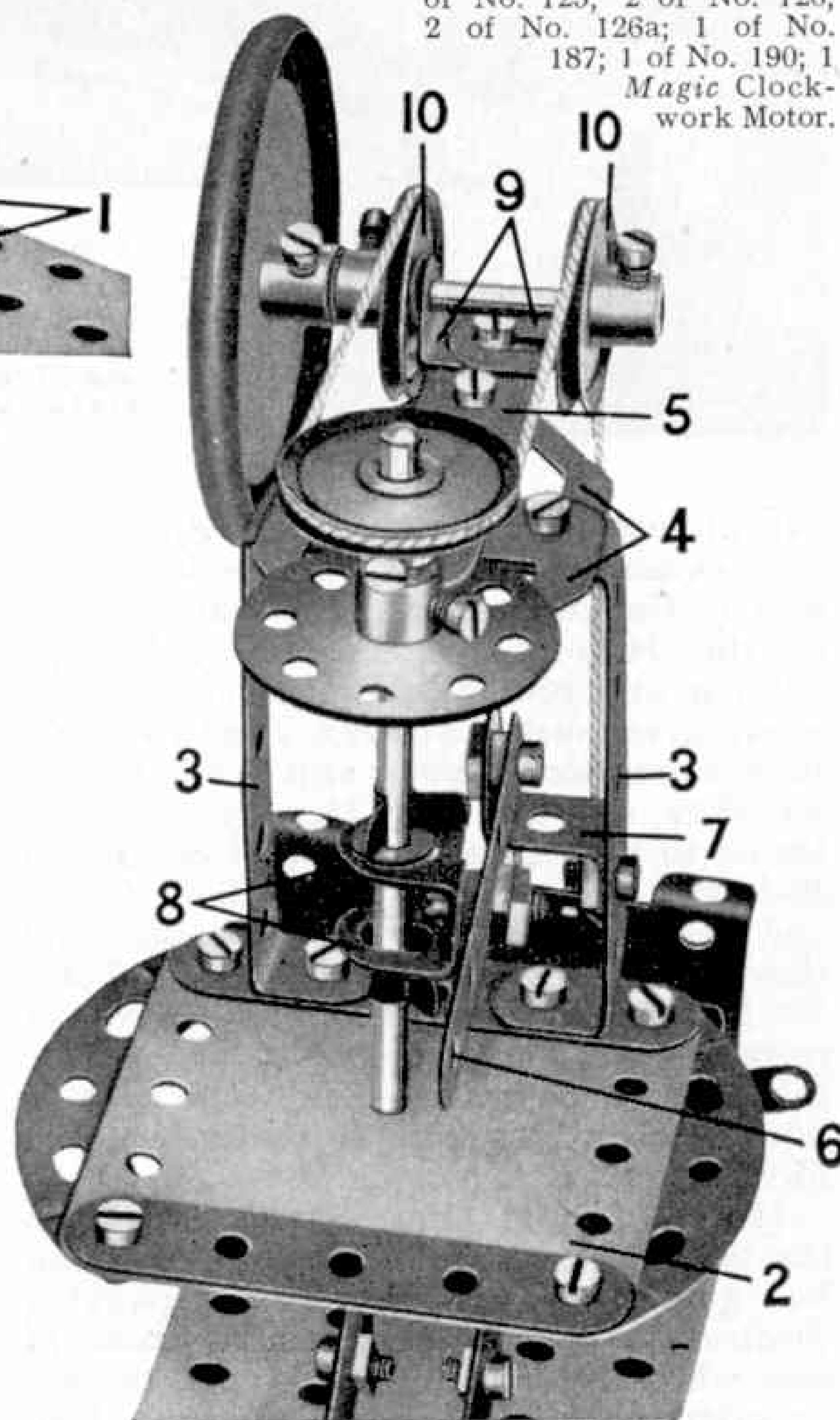


Fig. 3. A close-up picture of the drill head, showing the arrangement of the belt drive and the method of pivoting the drill control lever.

## HORNBY RAILWAY COMPANY

By the Secretary

# Good News for All!

THE most exciting times in the Hornby Train world are those when new items make their appearance in either the Hornby or the Hornby-Dublo range. I certainly enjoy being able to tell you about new things, and this month I have news for you of introductions in both gauges that will help to increase the fun of running your miniature railways.

Taking the order of these items from

immensely. The little No. 20 Locomotive looks really fine in its deep green finish, with orange and black lining, and how proudly the Tender displays the familiar "Lion and Wheel" emblem of British Railways!

The Coaches of the No. 21 Set too have been transformed! Hitherto they have represented Pullmans, but now they are finished in the characteristic B.R. crimson

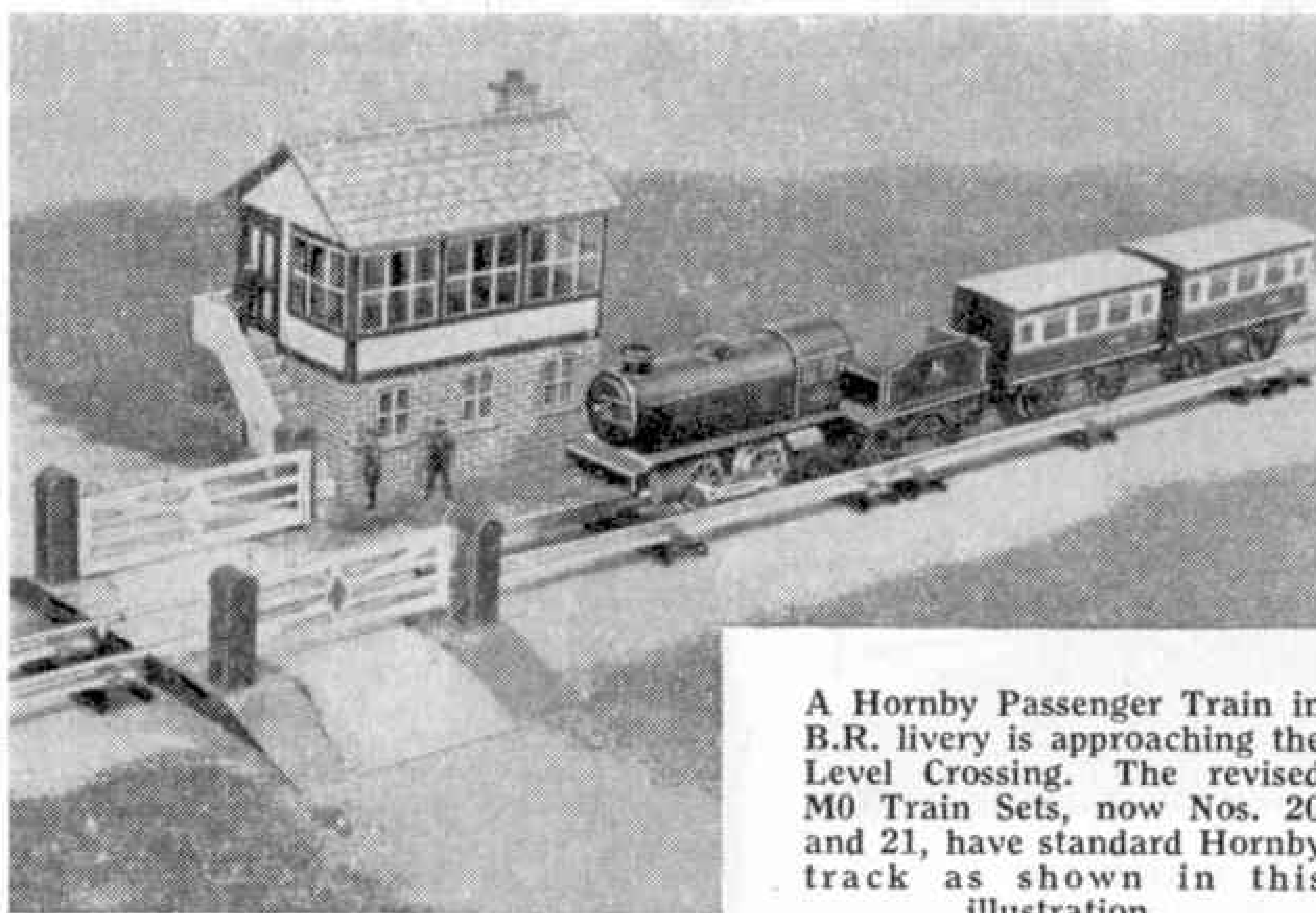
and cream livery, the general details being based on standard main line stock. The finish of the Wagons in the Goods Train Set has been brought more into line with B.R. practice, and these amended vehicles are now called Wagons No. 20.

In addition, an important change has been made in the rail contents of these Sets. Instead of the special M type rails, with their 9 in. radius curves, previously included in M0 Train Sets, the new Sets Nos. 20 and 21 have standard Hornby Rails with 1 ft. radius curves. These

curves provide an easier passage for the little trains than the sharper "nine-inchers." A very great advantage too is the fact that the original layout can be developed by means of the standard 1 ft. radius Points and Crossings. This change in the rail contents of the Sets means that the minimum space now required for these smallest Hornby Train Sets is 3 ft. 3 in. by 2 ft. 6 in.

Now to give Hornby-Dublo enthusiasts news that I know they have been waiting for for some time. A glance at my remaining two pictures will tell you what it is—the Hornby-Dublo Low-Sided Wagon is now ready.

Either as a separate vehicle, or in its alternative form loaded with two miniature cable drums, this Wagon is a welcome and attractive addition to the goods stock of the Hornby-Dublo System. Let me describe the Wagon with Cable Drums first. This is slightly longer in wheelbase

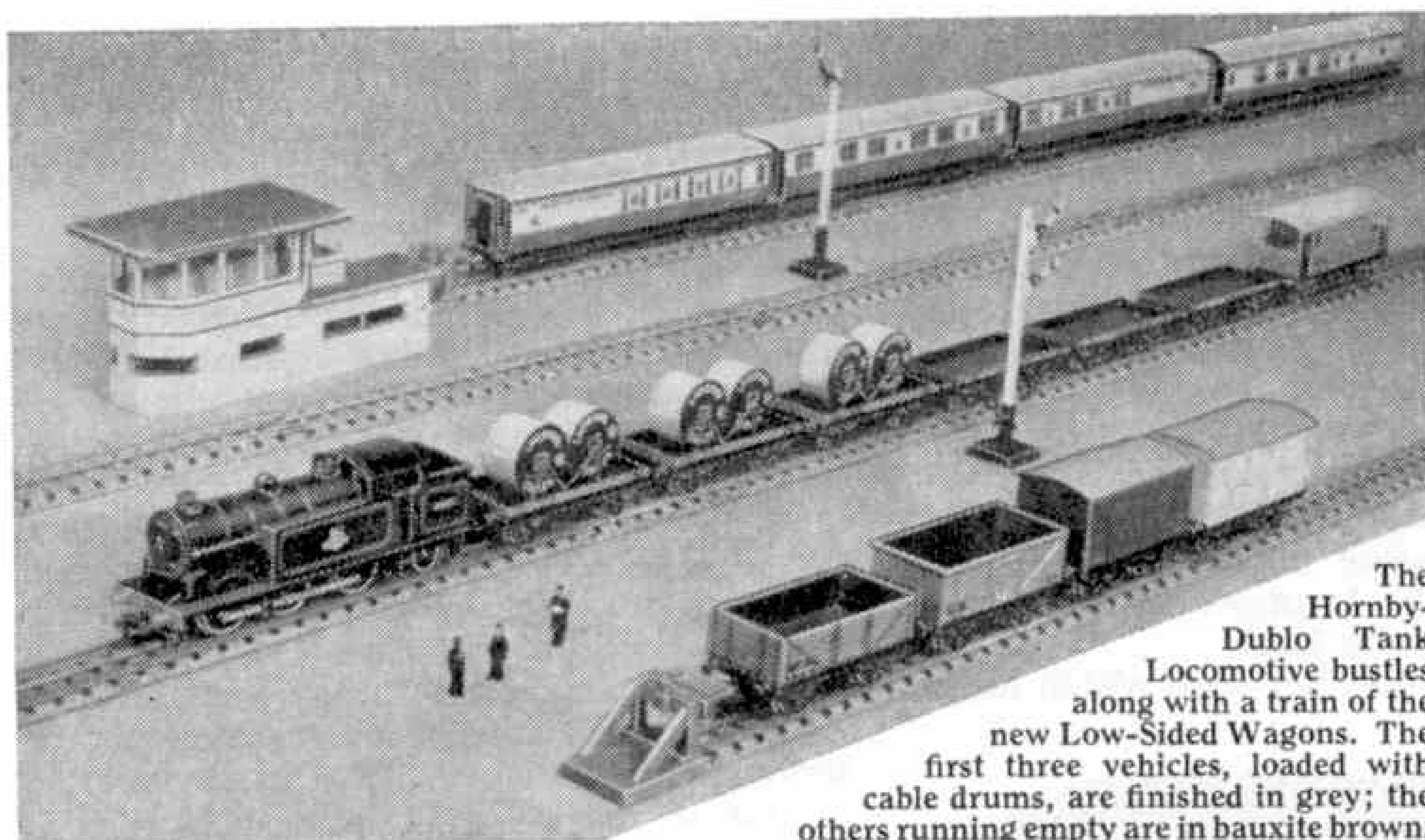


A Hornby Passenger Train in B.R. livery is approaching the Level Crossing. The revised M0 Train Sets, now Nos. 20 and 21, have standard Hornby track as shown in this illustration.

our pictures, I must first tell you about the revision of the well-known M0 Train Sets in Gauge 0. These, the simplest sets in the Hornby System, are extremely popular and provide the starting point in many an enthusiast's career. They are likely to be even more popular still in the future, for they are the first Hornby Gauge 0 trains to appear in the attractive British Railways livery. In addition, both Goods and Passenger Sets have been revised, and they are now known as Goods Train Set No. 20 and Passenger Train Set No. 21 respectively. The same engine and tender are used in these two Sets, and each is now described as No. 20 instead of the former M0.

How splendid the Passenger Train components look in their new finish can be gathered from the accompanying illustration, and I am sure that those of you who have already seen the new Sets at your dealers will have admired them





The Hornby-Dublo Tank Locomotive bustles along with a train of the new Low-Sided Wagons. The first three vehicles, loaded with cable drums, are finished in grey; the others running empty are in bauxite brown.

The Cable Drums themselves deserve a word of mention. They are made of wood, accurately turned to receive the printed paper discs that provide detail for the sides, and the wrapper that encircles the whole drum and

than the other Dublo four-wheelers, except the Brake Van of course, but it incorporates the usual features of the standard Hornby-Dublo wagon base, with dummy brake gear and so on. The bodywork represents a single-plank low-sided vehicle of a type that is extremely useful for many different purposes in actual practice. The Wagon with Cable Drum is finished in B.R. grey, with small white lettering applied on the usual black background.

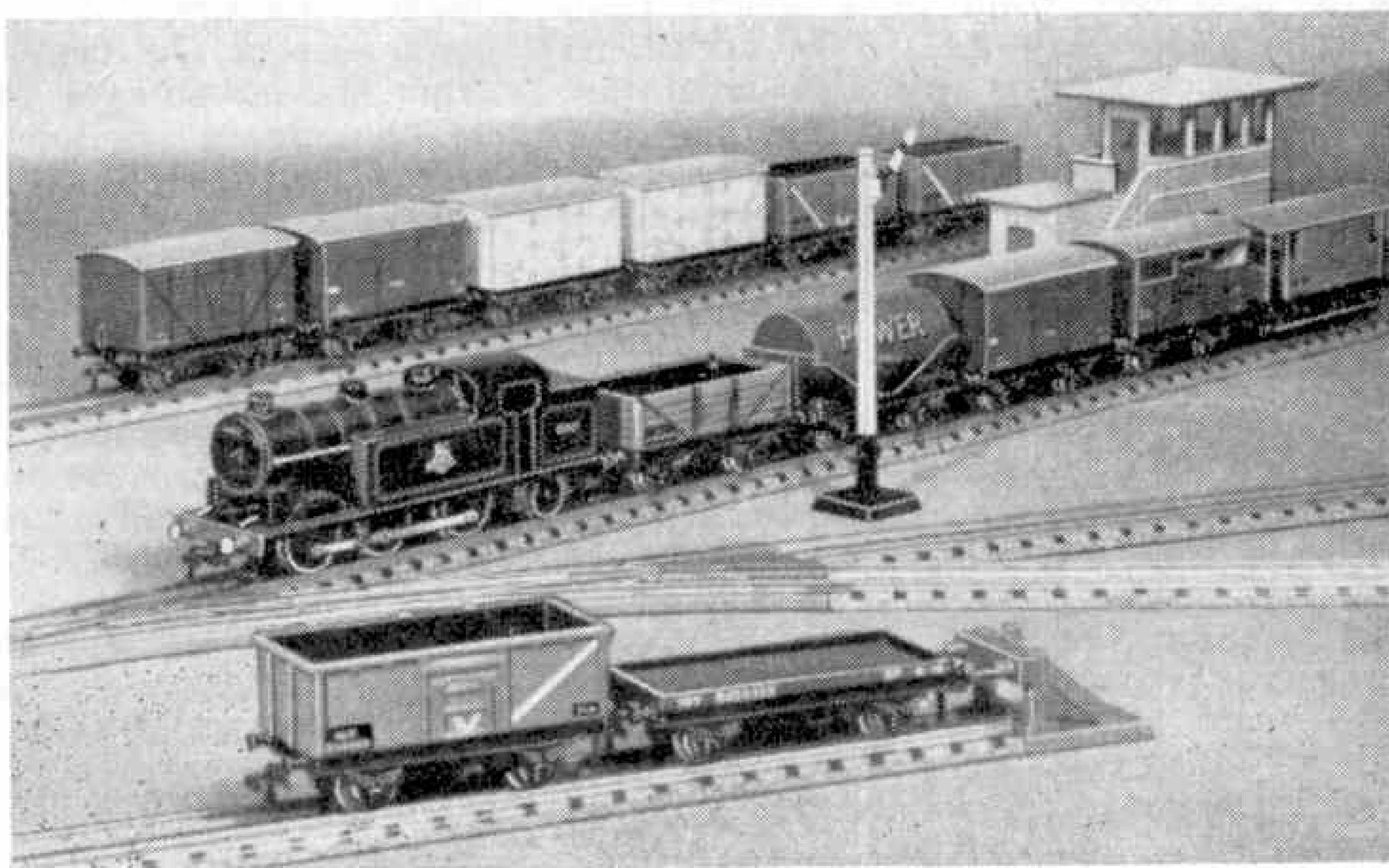
In order to accommodate the Cable Drums, small projections are cast on the Wagon floor and these serve the same purpose as the wooden chocks that are nailed to the floor of a real vehicle when the cable drums are carried, to help in preventing the drums from rolling about when the wagon is on the move. In order to restrain them further the miniature drums are "roped" through their centres to the wagon in a similar manner to that invariably employed when real cable drums are being transported by rail.

Freight traffic is the keynote here. Here again the new Hornby-Dublo Low-Sided Wagon is prominent, in the siding in the foreground.

provides a representation of the cross timbers that protect the cable in transit. Appropriately enough the sides bear the wording *Liverpool Cables* in white on a black background.

The ordinary Low-Sided Wagon is similar in design and construction, but the floor of this vehicle is plain, as it lacks the "chocks" that are characteristic of the other vehicle. It can be used for many purposes, and Hornby-Dublo owners will have plenty of fun devising suitable loads for it.

The Wagon is finished in the B.R. bauxite brown that denotes a vehicle fitted with automatic brakes and therefore suitable for fast traffic. The lettering is in white and includes the "XP" designation that appears on fully-fitted wagons in actual practice.



# Looking for Variety

## Good Ideas in Hornby-Dublo Working

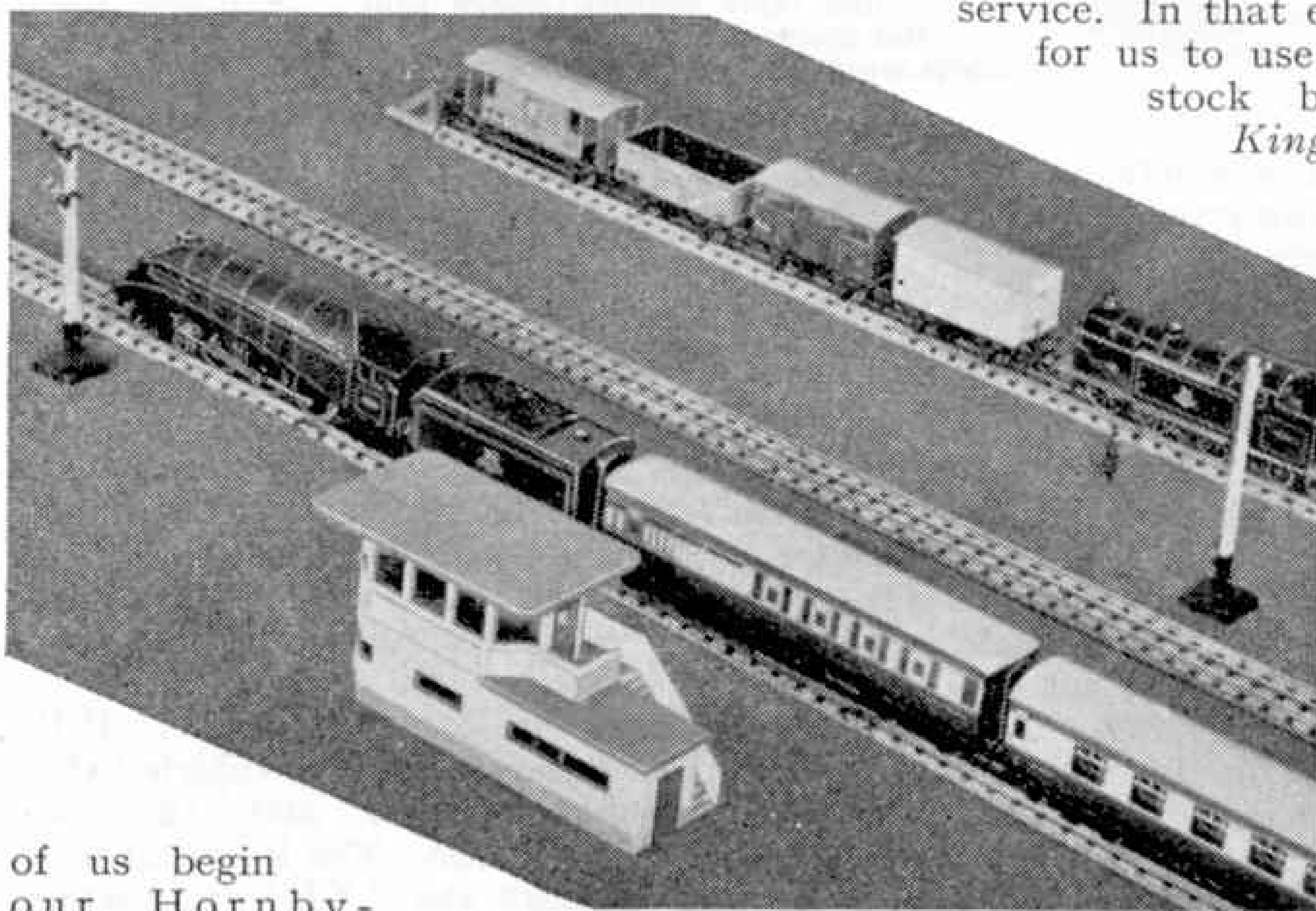
THE Hornby-Dublo railway owner is fortunate in the variety of interests that he can introduce into his railway working. Attention to layout planning frequently suggests the making of changes here and there in order to improve operations, while additions or modifications to the lineside scene and general set-up make for constant improvements in the general aspect of the line.

The standard Train Set with which most

some mixture of stock is bound to take place at times. So, in the illustration on this page a *Silver King* Locomotive has next to the tender what we should all expect, that is a Brake Third D11 Coach of the characteristic Regional design; next to it, however, comes a London Midland type of vehicle which although different in detail does not look out of place when coupled to the other Coach.

It may be the rule that each Region alternately provides stock for a particular service. In that event it is quite in order for us to use a train of L.M.R. D12

stock behind an E.R. *Silver King* for instance. This represents the sort of thing that can be seen in actual practice on the Liverpool-Newcastle



The Hornby-Dublo *Silver King* heading an express composed of E.R. and L.M.R. vehicles, a combination of stock sometimes found in real practice today.

of us begin our Hornby-

Dublo railways contains the minimum equipment for the assembly of a passenger train or a goods train as the case may be. The additional rolling stock that is available separately makes it possible to put together and operate trains of varied kinds, and variety in make-up and running naturally affords constant interest to the keen operator.

There is no need to restrict the choice of additional stock to the types included in a particular standard Set, although naturally we wish to be consistent in the make-up of our trains, especially the passenger expresses. Apart from long-distance expresses there are plenty of express trains of a secondary character in real practice. On these for one reason or another it is often possible to see a variety of vehicles. Naturally where such trains are of the cross-country variety and working between one Region and another,

and similar through services.

Some Hornby-Dublo owners in fact prefer the more detailed D12 vehicle and make a practice of using this type of stock regardless of the type of engine. Apart from its advantages in appearance due to the glazed windows and so on, the general contour of the vehicle is very similar to that of the B.R. standard stock used on so many principal train services today.

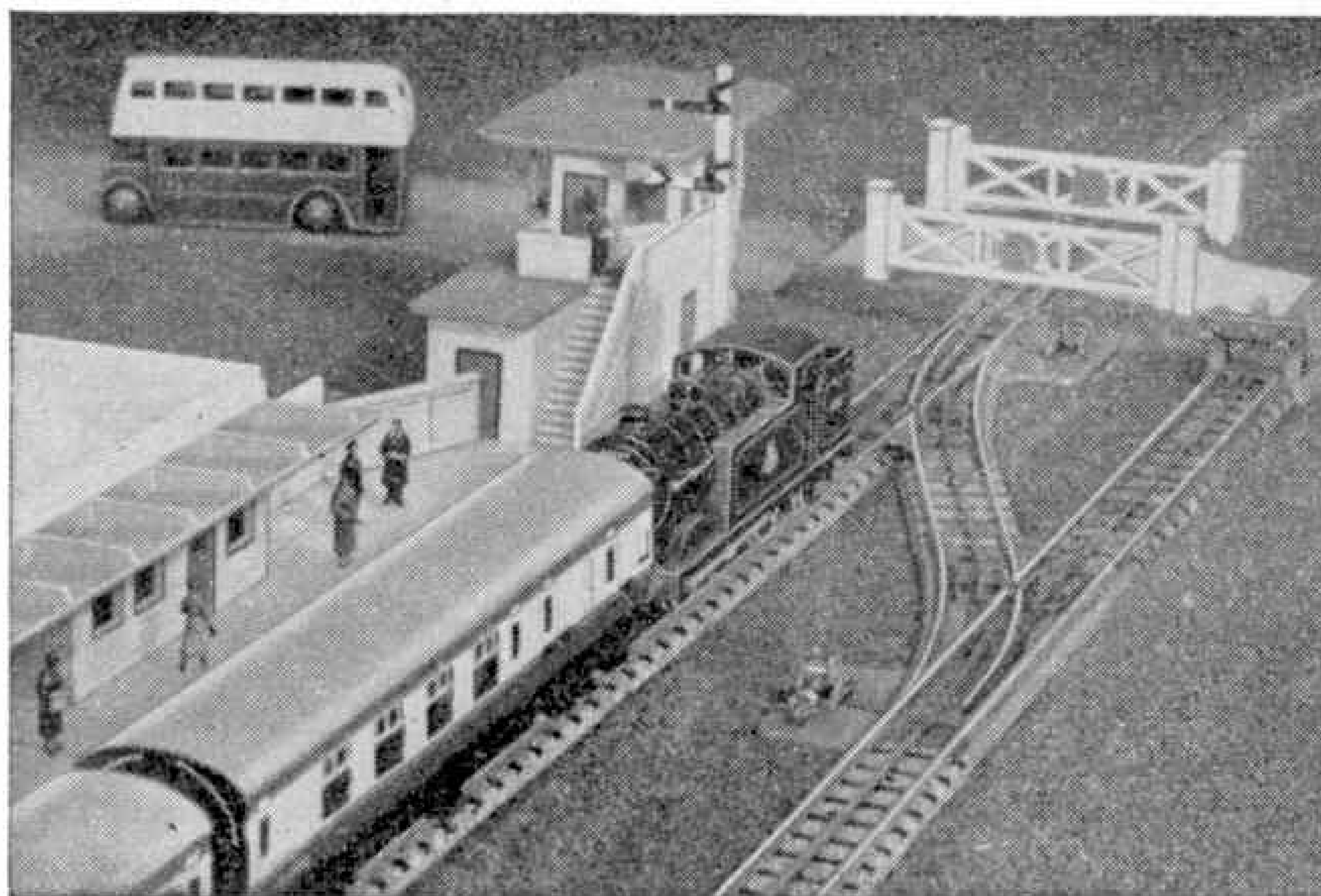
The provision of suitable vehicles for stopping trains presents the Hornby-Dublo owner with a difficult problem, although it is hoped to provide him with the correct answer in due course. For the time being, however, the Hornby-Dublo owner must use his main line stock for ordinary work and one of our illustrations shows this being done. After all, real corridor vehicles do spend some of their time on stopping train services, especially between turns of main line duty.



Working arrangements of this kind may necessitate smart station work, and provide plenty of scope for the inclusion of run round loops, isolating sections, uncoupling rails and so on. It is in these respects that the detailed planning of the layout should be closely related to the working that is to be practised. This is a point that is sometimes lost sight of by Hornby-Dublo engineers. There is often a tendency to plan on a rather more complicated scale than is necessary for the movements.

On the other hand the position of the essential features such as isolating sidings or Buffer Stop sections, loops and Uncoupling Rails must be carefully related to the movements anticipated and to the lengths of the engines and trains that will carry them out.

The lengths of the loops along the main line particularly will affect the lengths of trains that can be held in them. Probably the length of the passenger trains on Hornby-Dublo layouts does not vary much, but when making up freights there is always a temptation to add "just one more." We must check this tendency

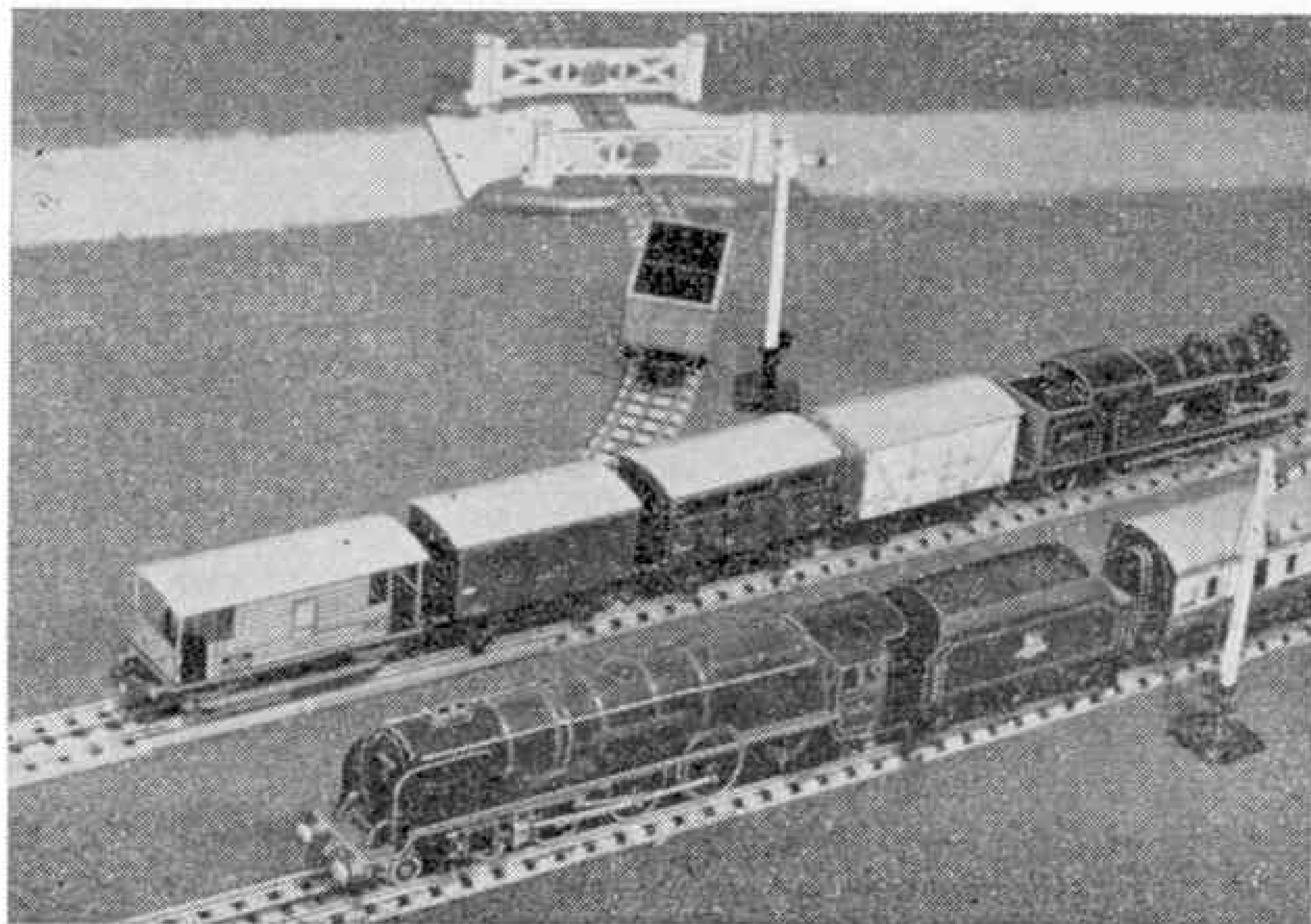


A local train at a Hornby-Dublo Station is waiting for the gates of the Level Crossing to be opened before it can go on its way.

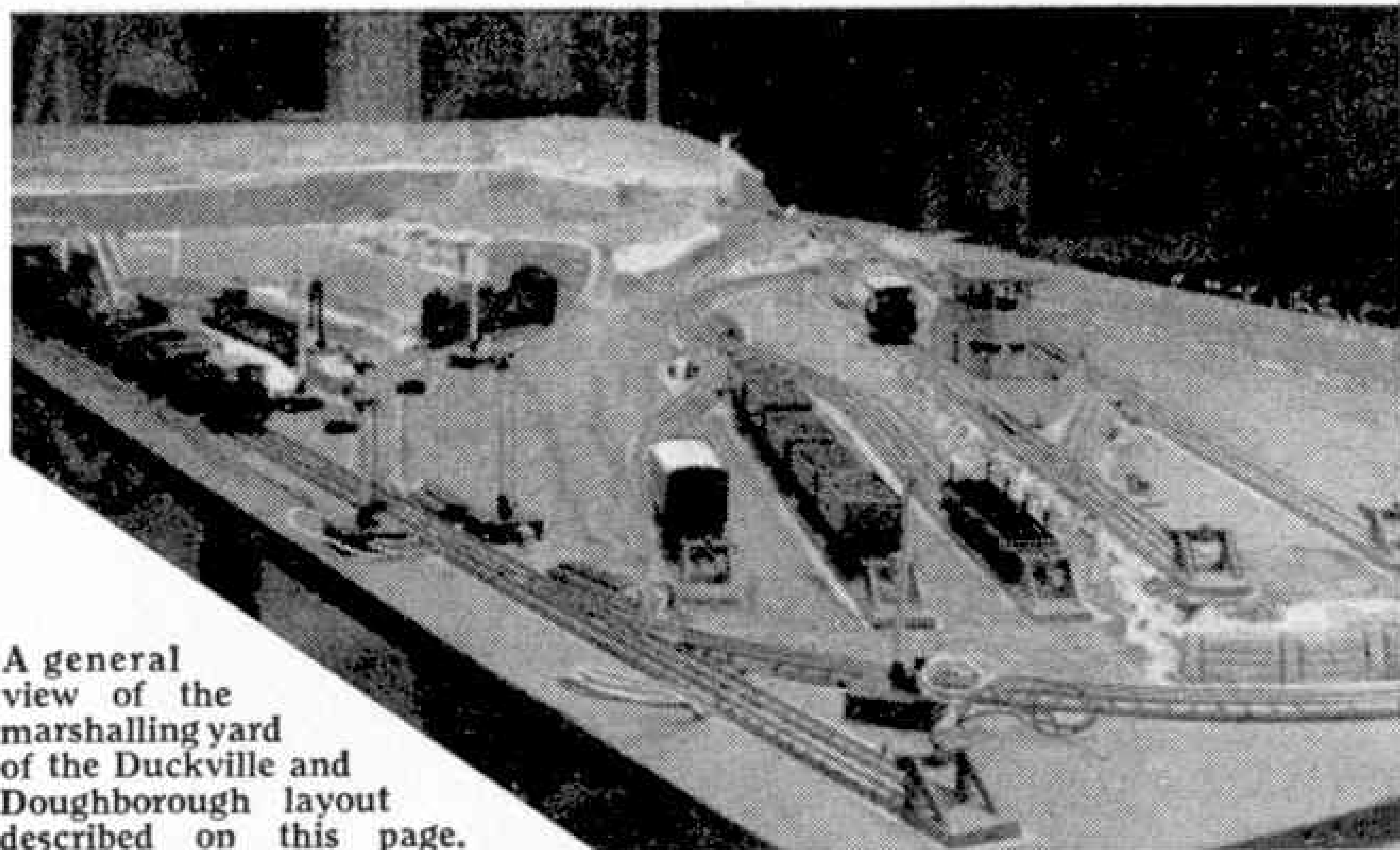
and see that the "5 Vans and Brake," or whatever is the train acceptable in our shortest loop, is not exceeded. Otherwise the fast freight traffic on our line—an important part of the business—will be upset. This in turn will interfere with other services.

By their very nature our freight trains offer more variation in make up than passenger services. Pick up or local goods trains will consist of wagons and vans and there can be pleasing variety in the composition of some of the longer-distance goods trains. Some of these will be made up of vans only, often of one kind of vehicle, such as Goods Vans, Cattle or Refrigerator Vans.

Apart from the inclusion of the Hornby-Dublo Level Crossing, a recent and welcome accessory, the upper illustration shows a Hornby-Dublo train alongside the station platform. There is nothing very special about this, of course, but the crossing gates are closed across the track for the benefit of road traffic. So the train is waiting for the Crossing to be opened and the signal arm moved before it can leave. Notice how much the miniature figures on the platform add to the realism of the scene.



The Duchess of Montrose is seen here passing a train of vans. The Mineral Wagon on the siding is waiting to be picked up by a convenient train.



A general view of the marshalling yard of the Duckville and Doughborough layout described on this page.

## The Duckville and Doughborough Line

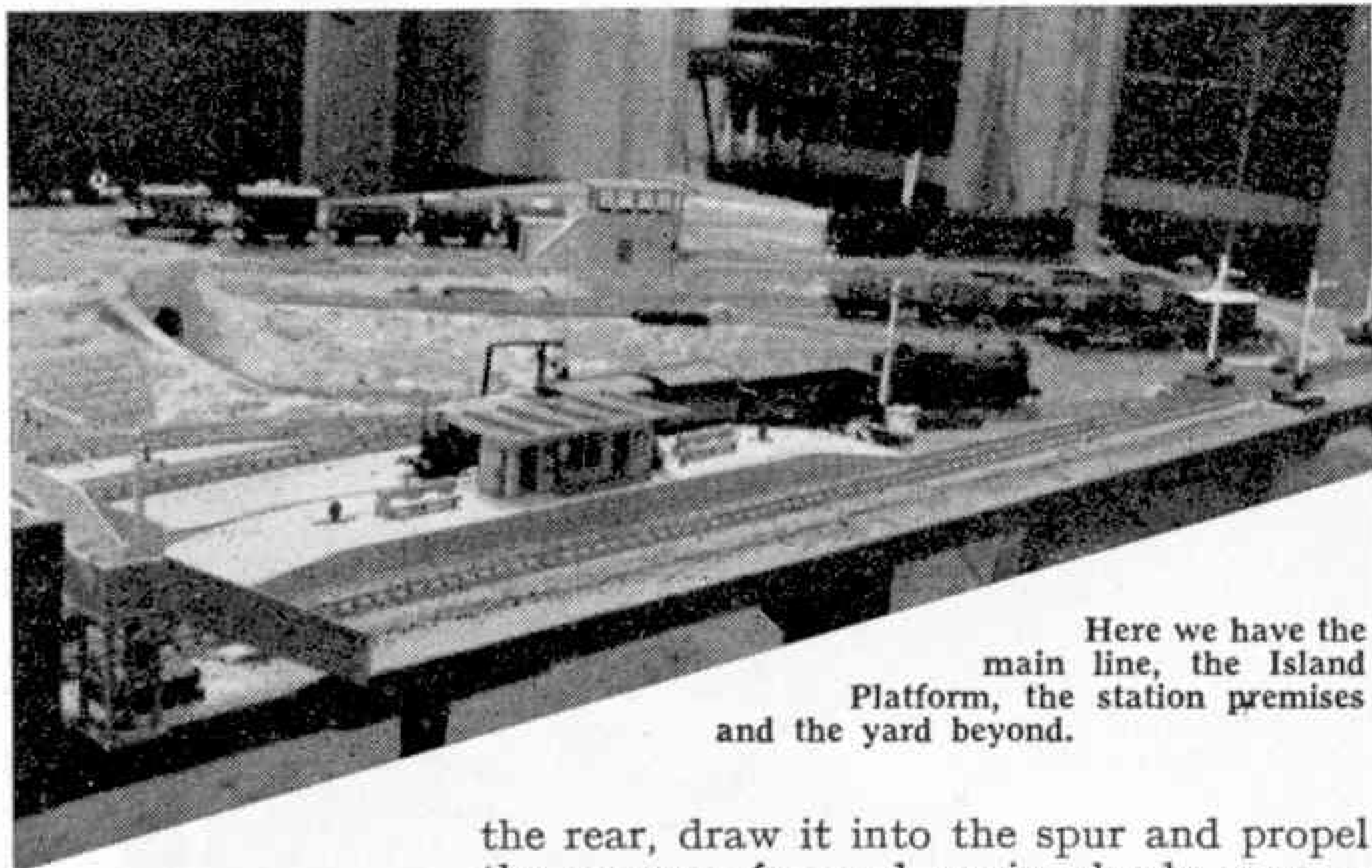
out of another tunnel mouth. The train in the upper illustration is doing the latter, and will be running in the opposite direction from which

A LAYOUT on which the principal interest lies in a marshalling yard is unusual, and for this reason the two illustrations on this page are of special interest. These show the Duckville and Doughborough line, a Hornby-Dublo system that has been developed by a keen operator, the Rev. P. E. Wadey, B.D., of Wellingborough. I like its fanciful name, but I like still more its special purpose, which is to provide a model of an entertaining nature that can readily be transported to local Children's Homes, or used for display purposes at parish functions and so on. Therefore the layout itself is permanently secured to a baseboard, but the board itself is semi-portable.

There is of course a main line track for passenger and goods traffic on the line, although the marshalling yard and arrangements form its centrepiece. On this a train travelling clockwise passes the Hornby-Dublo Island Platform and Footbridge before entering a tunnel. This has been driven through high ground that has been built up at one end of the baseboard. Inside the tunnel the track divides, so that the train can emerge to carry on round the oval, or it can follow an inner reverse loop and make its way

it started when it does rejoin the main track. It can travel right round the main line as before and then be diverted inside the main oval to reach the shunting neck that extends over the tunnel.

Alternatively, a freight train can ultimately reach the reception road on the further side of the yard Signal Cabin seen in the upper picture. As a rule the engine is detached at this point, and isolated. Then an engine that is kept on the shunting neck can approach the train from



Here we have the main line, the Island Platform, the station premises and the yard beyond.

the rear, draw it into the spur and propel the wagons forward again slowly over a shunting hump, on which an Uncoupling Rail is located. The hump leads them down to a series of three sidings that can be seen fanning out towards the camera in the upper picture.

Afterwards the vehicles can be re-assembled in different order ready for a further journey with another engine.





# Club and Branch News



## WITH THE SECRETARY FROM INDOORS TO OUTDOORS

With six months of Club or Branch indoor activity behind them members will be eager for the traditional change-over to outdoor recreations that is heralded by the beginning of the first Summer Session. Alert Leaders and Chairmen will have foreseen this weeks ago, and be ready for the transition. Indeed, it is well to have the whole Summer's programme roughed out at least sufficiently for members to gain a fair idea of what is in store in the way of outdoor games, rambles, cycle runs, swimming events and so on.

Some matters, like the destination of Saturday rambles and cycling runs, can be fixed up at short notice, but others, like a summer holiday camp or a long-distance party excursion to some seaside resort or holiday centre, may need weeks of preparation and "saving up," and arrangements for these should be put in hand early in the present Session.

### A FORTHCOMING CLUB EXHIBITION

St. George's (Gateshead) M.C. will hold their third Annual Exhibition on Saturday, 3rd April, in St. George's Church Hall, Durham Road, Gateshead. This Hall is near Shipcote Picture House. The Exhibition will be open from 3 p.m. until 9 p.m., and there will be a large Hornby-Dublo layout in operation, with an excellent display of Meccano models, model aircraft, petrol engines, etc.

### BRANCH RECENTLY INCORPORATED

No. 549—BELGRAVE UNION (LEICESTER)—Mr. B. Pullen, 19 Thornville Close, Leicester.

## CLUB NOTES

EXETER M.C.—The Exhibition was a great success, and resulted in a profit for the Club funds. Model-building has been continued as enthusiastically as ever, and models completed have included a roundabout, television set complete with mast, and a space rocket with launching platform and control tower. Club roll: 33. Secretary: Philip Wright, 65 Prince Charles Road, Stoke Hill, Exeter, Devon.

COPDOCK AND WASHBROOK M.C.—New equipment obtained includes a Hornby-Dublo Tank Goods Set, extra rolling stock, points and rails, and the way is now open for a fairly large layout to be constructed. The fretwork section are to construct some lineside buildings for the new layout. Club roll: 12. Secretary: K. E. Whitten, The Street, Copdock, nr. Ipswich.

MILE END (PORTSMOUTH) M.C.—A very successful Open Night has been held, for which there was a good entry of models, drawings, paintings, etc. The Club electric layout and model town were great attractions. The dismantling of the trolley bus model is well in hand, each member having his own "department" and being responsible for the

Meccano parts for which he is concerned being restored to their correct boxes. Under contract from the "Carnegie Dockyard" the Club has to build a model submarine within three months. The job has been eagerly begun, with each member responsible for a particular part. Club roll: 52. Secretary: Mr. A. J. Nicholson, 213 Sultan Road, Buckland, Portsmouth.

### AUSTRALIA

FREMANTLE AND DISTRICT M.C.—The outstanding recent event was a Model-building competition staged in a room at the Town Hall, to which the public were invited. The models were judged by two competent judges and prize cards awarded. The winning model in the Open section was a racing car and in the Minor section a helicopter. Sir Frank Gibson, the Club patron, presented two Merit Medallions during the evening, in the presence of parents and friends of the members, and the proceedings concluded with an excellent Film Show. Club roll: 16. Secretary: G. Shea, 12 Foss Street, Palmyra, Western Australia.

## BRANCH NEWS

EAST GRINSTEAD—A very extensive new layout is under construction. It is being built in four separate sections arranged, when assembled, so as to provide an operating bay for the two signalmen who will operate the layout. There will be three main tracks round the board, and three Controllers for the layout will be installed on a platform at the far end of the room, overlooking the model. A fourth Controller will operate the goods yard, which will be independent of the other tracks. Secretary: B. Heasman, 69 Woodlands Road, East Grinstead, Sussex.

HINDHEAD AND DISTRICT—Apart from an excellent Film Show, mainly of railway interest, meetings have been devoted to layout construction and operation. The Branch equipment now includes four baseboards with a total area of 96 sq. ft., 60 ft. of Hornby-Dublo track, and material and accessories for all types of construction. There are full facilities for repairs to locomotives, rolling stock and track. Secretary: B. J. Hinde, "Hindhead Brae," Hindhead, Surrey.

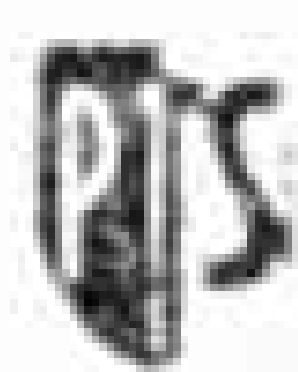


The coming Summer months are the time for excursions, and here is a happy reminder of such events. The photograph shows officials and members of the Belgrave Union (Leicester) M.C. and was taken when they visited Heath Row Airport, near London, last year.

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# Stamp Collectors' Corner

By F. E. Metcalfe

## THE ROCK

SEEN in perspective from an aeroplane high up, say with Europe stretching away on the left and Africa on the right, the Rock of Gibraltar looks insignificant indeed. And yet one could see clearly how completely its possession means for the owners the entire domination of the western entrance to the Mediterranean. This of course accounts for the annoyance felt by Spaniards that such a vital scrap of their territory should be in the hands of foreigners. When I was in Spain during last summer, a Spanish acquaintance remarked that it was just this one thing that prevented his nation and mine from being the greatest friends in the world. There is of course another thing, but your philatelic commentator was too polite to mention it!



concessions that the U.S.A. have made to Spain to get similar footholds in the country, it is evident that The Rock will not be given up lightly. I have called it a scrap of territory, yet at one point it rises to 1,400 feet and the precipices on the eastern side are almost terrifying. It is an open secret just how strongly fortified it is, and while the Germans during the last war felt that they could walk into it, were they allowed to try by the Spaniards, maybe they would have had one more surprise.

Spain wrested Gibraltar from the Moors in 1462, and held it until 1704, when a combined naval force of British and Dutch took it, after what was then a tremendous bombardment. Great Britain finally came into formal possession nine years afterwards, by the Peace of Utrecht. In 1779, Spain laid siege to The Rock. This effort actually lasted for four years, but it was unavailing, and while from time to time protests have been made against its occupation by the British we still remain there.

Gibraltar entered the philatelic field on 1st January 1886, and almost from the word go its stamps have been particularly popular with collectors. The handsome pictorial set issued on 19th October last had a great welcome in consequence, but more of that anon. The first set were rather unique in character, for

contemporary stamps of the West Indian colony of Bermuda were overprinted *Gibraltar*. This was merely a stop-gap issue of seven values from 1d. to 1/-, and by the end of the year stamps similar in face value, but specially designed for the colony, were issued. These stamps, and for that matter all Gibraltar issues right up to 1931, were dullness itself as far as appearance is concerned, and none of them is in the same street as the latest set from the standpoint of attractive designs. But it



is scarcely likely that these modern pictorials will ever be nearly so rare as are some of those dull looking issues, many of which are catalogued at several pounds each.

Stamps bearing the portrait of Queen Victoria continued on issue until 1903. Then we got three sets for King Edward VII, and in 1912 stamps featuring the head of King George V appeared. The first break in the deadly dull designs came with the 1931 issue. Four low values, oblong in form, showed not only the head of the King, but also an attractive view of The Rock itself. This was followed by the usual four "Silver Jubilee" stamps in 1935. Next we had the three Coronation stamps for King George VI in 1937, and in the following year came the first definitive set for the late King. Few sets have provided so much interest for collectors, for there have been a number of perforation varieties, several of which were so scarce that two of them cost about fifty shillings each, and another, owing to the watermark being sideways, actually brings £25.



And now for the new set. First of all, Messrs. De La Rue, who produced the last set, with the rare perforation varieties, have prepared the new one, but as they seem to have settled down to using the same perforation machine, we are not likely to get the shocks which K.G. VI collectors got. The set itself however is really worth picking up. Most of the designs have rather the appearance of watercolour sketches, and the colours in general rather lay emphasis on that illusion.

As for the subjects of the designs, just look at all those tunny fish on the 1½d. value—the Mediterranean is a great place for these valuable items of food. It costs a small fortune for one to go tunny fishing here at home, but as can be seen from the stamp referred to, they catch them by the score in the Mediterranean. Various views of the Rock itself can be seen on the 1d., 2½d., 3d., 5d., and 6d. values, and the 5d. stamp shows the airport as well.

The Cargo and Passenger Wharves are to be seen on the 1d. stamp, a bi-coloured one that is one of the nicest of the whole set; it is certainly more attractive than the top value. (Cont. on page 206)





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# Stamp Gossip

## LIGHTHOUSES

NOT very long ago—I think I mentioned it at the time—an Englishman won the prize for the best design of a new kind of lighthouse, to be erected in Central America as a monument to Columbus and his discovery of America. A number of stamps have been issued by various American republics with this design as the main theme, but it has been left to the Dominican Republic to issue a stamp that depicts the lighthouse all lit up, and showing in the sky, rather than out to sea as in the case of our own lighthouses, the reflection of a huge cross.

Such a break with tradition, and at the same time so great a novelty, was bound to appeal to Americans, but one cannot help but wonder if the idea is as practical as it is original. I suppose that most of us here at home will say give us our own Eddystone, etc. There is nothing out of date about their effectiveness, and that is all that matters.

## QUEEN NEFERTITI

In January I referred to the new Egyptian set, one of the designs of which illustrates the well-known bust of Queen Nefertiti. A reader, Mr. E. Murphy, tells me that the bust is in the Provincial Museum, Wiesbaden. Let us hope that one day it will be shipped back to the land where it belongs.

## ARTISTIC JAPAN

I must admit to really doting on Japanese stamps. The designs are always so intensely interesting. I like their simplicity; a Japanese artist with the mere turn of his brush can convey more than many Western artists can set down with a pot of paint. Time and time again, I would like to illustrate one or another of the new stamps that Nippon issues with such prodigality. This is not possible, but I cannot resist asking the Editor to include one that came on a letter quite recently. I have picked this one because I think that quite a few readers will be interested in finding out what the stars are that appear above the dome of the observatory.

Before I leave Japan, I would like to say a word about those sheets of stamps that so often turn up. Stuck on them are what appear to be a number of Japanese issues that are old and of course rare, as

they tell you when you buy them. They are manufactured and sold by the thousand, and all are complete fakes, even the common stamps. Thus they are not worth a copper. If you want to collect Japanese stamps—and it would be a good

selection—stick to the modern issues. These are mostly reasonably priced, and simply chock-full of interest, as far as the designs are concerned.



## THEMATICS

You cannot keep thematic collecting out of the news, and as it is such a popular form of collecting, there is no reason why you should. No doubt a number of readers visited the London Exhibition held at the Central Hall, London, in January. It was my task to gather the material for the 39 frames allotted for the display of KG VI stamps. In the previous year there had been a lot of grumbling regarding the way these stamps had been neglected in the first Exhibition, so the committee were anxious to make amends. Unfortunately one collector, down to exhibit 36 sheets, had an accident at the last moment, and apparently had not got his material ready. Moral to would-be exhibitors—be on the top line with your promises!

So it was a scramble round to find stamps elsewhere. I myself worked all Boxing Day, mounting what I could get together. In view of the popularity of thematic collections I was determined

to show that one could collect KG VI stamps, and still collect topically, to use the American designation for this class of collecting. So a "ship" collector was asked to exhibit, and it must have been an eye-opener to many to see what can be made of a few stamps.

While on the subject of thematic collecting, a table given in *Stamp Collector's Fortnightly* of the composition, by subject, of the collections being made by members of the American Topical

Association is of great interest. Flowers are apparently the most popular subjects, followed by trains, and ships. Religious stamps are a good fourth, after which come animals, birds, sports, music, Americana and maps. If a list could be made of British tastes I think that ships, trains and architecture would fight it out for first place, with ships as a likely winner. What do you think?

## SPORT

One reader has taken me to task for not giving more space to the "beautiful stamps of France". Well it is true that many of France's stamps are beautiful, but it is scarcely true that I neglect them. But with so many other beautiful stamps to deal with, one cannot refer to the same country every month. It must be admitted that the stamps of our neighbour do deserve attention quite frequently, for they are readily obtainable and cheap. Just take the stamp illustrated. It is one of a set of four recently issued, all with sporting subjects, and was taken from an ordinary packet.



**Westward by Pullman**—(Continued from page 161)

journey between them. Beyond Exeter it is the appropriately named West Country Pacifics, a lighter version of the same general design, that provide the haulage, while assistance on the particularly severe gradients is often provided by one of them as well.

Both the Merchants and the West Countries had become familiar in their brilliant green livery before the former Southern Railway introduced the *Devon Belle*. Now of course both classes sport the darker B.R. green, the standard colour scheme being modified somewhat because of the "air-smoothed" casing peculiar to these locomotives.

For some time the engines hauling the *Devon Belle* carried not only train name headboards at the front, but additional title boards, more or less wing-shaped, were attached to their smoke deflectors. Last year, these were replaced by a standard design of head board and the side boards were dispensed with. The new standard board is neat and has the merit of being readily fitted or removed on any type of Southern locomotive.

**A Giant Machine Tool**—(Continued from page 163)

ram. The motor is reversible and is controlled by push button switches. A hand lever in the gear-box selects the saddle or ram movement desired.

Altogether 28 motors and generators are employed for operation and control of the mill, and the electrical system includes special control circuits and interlocking devices that ensure the highest degree of safety and convenience. Control is exercised from the main desk type station, where 13 coloured safety lights tell the operator at a glance the positions of the more important controls. There are also smaller desk-type push button pedestals on each saddle, and two push button stations of the pendant type suspended from swivelling arms that duplicate the main motor controls and operate certain others.

**Plants of the Desert**—(Continued from page 181)

the plant bodies.

To obtain the full beauty of a cactus collection it must be arranged effectively. A small collection in a window of a living room can give quite as much pleasure and interest as a large number of plants in a greenhouse. What is more, if you are fortunate enough to have a "bay" window facing south there is no limit to what you can grow successfully.

If you intend growing only a few plants it is a good idea to put a number of small ones into a large pot. This should be filled to at least one third of its depth with drainage material, such as broken or crushed brick, gravel, coarse grit, or something similar. You can buy a good potting mixture from a nursery supply stores, or try your hand at mixing one yourself. A suitable compost consists of three parts loam, two parts sharp river sand, and one part leaf mould. To this you should add a small quantity of broken brick and old mortar rubble. A little charcoal will also help to keep the soil sweet.

**Scientific Glassware**—(Continued from page 169)

punty, are cut off and allowed to crack away to form cullet for another melt.

Symmetrical objects such as flasks, beakers and dessicators, are for the most part blown in moulds. A gather on the blowpipe is roughly shaped, brought up to the correct temperature and lowered into the open, hinged, iron mould. An assistant closes the mould with a snap—the faces are already cooled and lubricated by water—and the gather is revolved and blown to take the shape of the mould. The soft glass is prevented from sticking to the iron by a thin cushion of steam, which forms between the two surfaces. By the time the object has become dull red-hot it is hard enough to be removed from the mould, and cut away from the remains of the gather on the parent blowpipe.

Since glass is a relatively poor conductor of heat, and during blowing, drawing or moulding the cooling is generally uneven, the article has a residue of internal stress. This is liable to produce cracks, if not in the final cooling, then in subsequent use. To avoid this an annealing process is begun as soon as possible, by reheating until the glass is some way below its softening point. The temperature is then held there while internal strain is relieved by viscous flow, and afterwards is allowed to fall very slowly. This annealing is naturally simplest and most rapid for small pieces of apparatus, made of thin glass and without sharp bends. For these the annealing time may be measured in minutes, in contrast to that required for the enormous borosilicate disc cast for the 200" Mount Palomar telescope. The annealing process for that lasted a year!

**Stamp Collectors' Corner**—(Continued from page 203)

The £1 stamp is in scarlet and yellow, with the Arms of the Colony as the motif; quite the poorest effort of the lot! Another attractive and unique design is that of the 5/- value. We see the Main Entrance of Government House, and the manner in which the wall has been made to fill up all the space of the design shows what a sturdy building this really is.

There is one point to be remembered about these Colonial sets. Several of the most attractive stamps are to be found among the low values. This is a very good thing, for it means that those of us who have not too much loose cash for stamps can still make a nice showing with what little we have to spend.

**"THE NEW HOME PHOTOGRAPHY"**

By A. R. PIPPARD, B.Sc. and K. P. McDONNELL

Johnsons of Hendon Ltd., the well-known photographic firm, have published a new edition of the above book, which will be of great interest to all amateur photographers. The first section deals with taking the picture, and serves as an introduction to portraiture, landscapes, action photography, etc. It covers only basic principles, as there are many books available about each particular branch. The second half of the book is devoted to developing and printing.

As in the case of the previous edition, an outstanding feature of the book is the wealth of half-tone illustrations, covering a wide range of successful photographs. There are also pictures of the equipment required in order to do one's own developing and printing, and illustrations showing the correct way to use the items concerned. Finally there is a very useful glossary of photographic terms.

**This Month's Special Articles**

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# From Our Readers

*This page is reserved for articles from our readers. Contributions not exceeding 500 words in length are invited on any subject of which the writer has special knowledge or experience. These should be written neatly on one side of the paper only, and should be accompanied if possible by original photographs for use as illustrations. Articles published will be paid for. Statements in articles submitted are accepted as being sent in good faith, but the Editor takes no responsibility for their accuracy.*

## SUGAR IN BRITISH GUIANA

Recently I spent a week with a friend who is an overseer on one of our sugar estates here in British Guiana. Most of the overseers are English, but my friend is a Guianese like myself. The labourers on the sugar estates here are chiefly descendants of indentured East Indians brought here from India years ago, and they have been enjoying an improving standard of living during the last few years both as regards pay and general housing conditions.

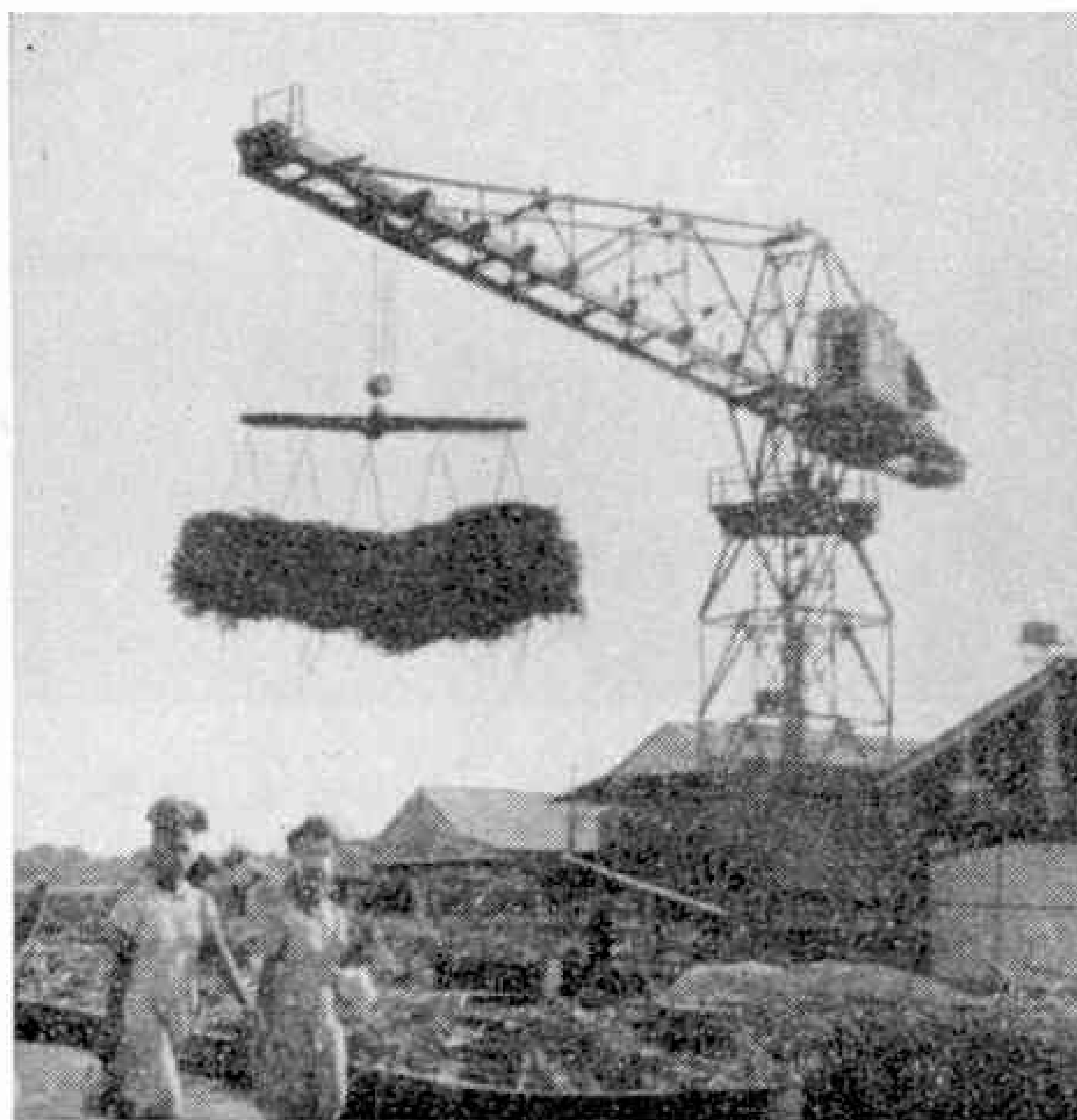
The estate I visited is about 80 miles from Georgetown, our capital city, and is one of our largest sugar producing estates. The factory is worked entirely by steam. The furnaces are started by burning wood, but after the cane has been passed through heavy rollers in the mills, and the juice extracted, the refuse is used as fuel to keep the furnaces going.

The cane juice is put through an extensive liming process and left for a while in the clarifier boxes to settle. It is then run into evaporators, where it is boiled to a syrup and afterwards sent to the pans, where the liquid crystallizes. The crystals are separated from the molasses in centrifugal extractors. The molasses from the first curing is boiled again with syrup and made into second sugar and the remainder, which is called final molasses, is shipped away to be used in the making of confectionery or is used locally in the manufacture of rum. British Guiana Rum, better known as Demerara Rum, is also well known in England and elsewhere.

British Guiana sugar is exported to England and Canada in large quantities, where it is refined and transformed into white sugar. It is however said that the refining process robs the sugar of many of its valuable properties. Here in Br. Guiana we use mostly a yellow crystal sugar, and a light coloured sugar also is available.

As the illustration suggests, water transport is largely used on the estate.

C. B. L. OSBORN  
(Georgetown).



Hoisting sugar cane from punts on an estate in British Guiana. Photograph by C. B. L. Osborn, Georgetown.



Mysterious steps at Repton are seen on the left of this illustration. Photograph by A. Pugh Thomas, Hoylake.

## MYSTERY STEPS AT REPTON

The steps shown on the left of the accompanying photograph are set into the side of the wall of the ancient monastery at Repton, which was once the capital of the kingdom of Mercia. A mystery has grown around these steps, as no one can explain why they should be there. There is a popular superstition that anyone who jumps off them will die within four weeks.

The narrow passage leads through the buildings to the old cloister garth where the monks used to meditate. At the other side of the garth stood the old chapel, but this has been replaced by modern buildings. In the centre of the garth is a pillar that is a memorial to old Reptonians who died in the 1st World War.

I hope that this short article will prove of interest to those people versed in history, who may have theories to explain why the steps should be there. Until

a satisfactory solution is found I, for one, will keep my feet on the earth beneath them.

A. PUGH THOMAS (Hoylake).

## A PUSH-PULL TRAIN

The Stourbridge Town—Stourbridge Junction branch is a short, bendy stretch of track. It is about a quarter of a mile long and is worked usually by an auto-train headed by a W.R. "1400" Class 0-4-2T locomotive, which puffs proudly up and down the line. The track is double, but the auto-train only occupies one track. The other is a works line and drops steeply down at a stiff gradient.

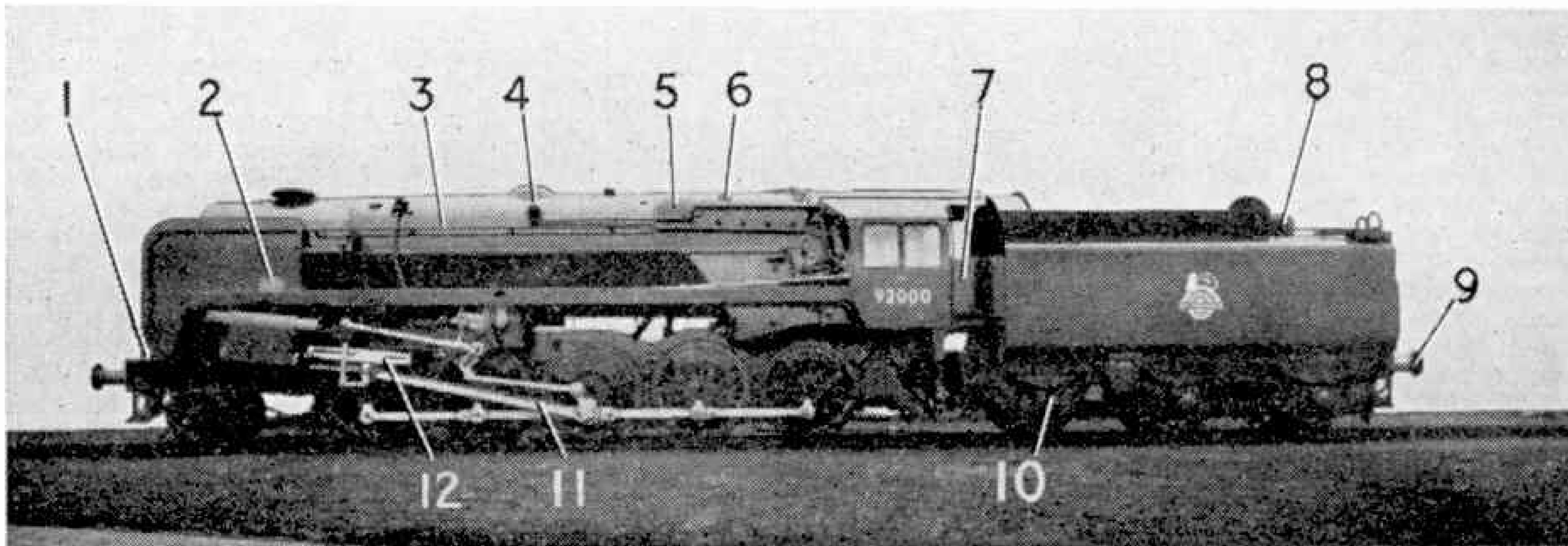
The Town Station consists of one long platform, with a big booking hall and waiting rooms and other big rooms that are painted in brown and cream. The train puffs backwards to go to the Junction, with the driver in a cab at the end of the coach, and always arrives there when a main line train has just come in. When the Welsh expresses arrive the drivers usually grin at each other, because the little locomotives look quaint alongside the express engines.

A. T. READE (Wolverhampton).

# Competitions! Open To All Readers

*Prize-winning entries in M.M. competitions become the property of Meccano Ltd. Unsuccessful entries in photographic, drawing and similar contests will be returned if suitable stamped addressed envelopes or wrappers are enclosed with them.*

## Try This Easy Contest!



The illustration on this page is a reproduction of a photograph of the first of the new British Railways Standard 2-10-0 heavy freight locomotives, described in last month's *M.M.* On it various component parts have been indicated and distinguished by numbers. This has been done with a purpose. For our Competition this month we ask readers to identify these components and to give a short description of the purpose of each part, explaining in only a few words what it is intended to do.

To make this clear, let us consider for instance the part numbered 1. This will easily be recognised as a lamp iron, and its purpose is simply that of holding a headlamp in position.

When a reader is satisfied that he has identified all the parts, and has given their purposes correctly, he should write them down in numerical order, using only one side of the paper, and not forgetting to add his name, age and full address. His entry should then be placed in an envelope addressed *April Locomotive Contest, Meccano Magazine, Binns Road, Liverpool 13*, and posted to reach here by 31st May if he lives in Great Britain or Northern Ireland, and by 31st August if he lives overseas.

In each of the two sections of this competition, for Home and Overseas readers respectively, there will be prizes of 21/-, 15/- and 10/6, and a number of Consolation Prizes will be awarded for other deserving efforts.

## Spring Photographic Contest

The ideal subject for a photographic competition this month is Spring, and therefore we invite readers who are enthusiastic amateur photographers to send in photographs that illustrate conditions or events of the Spring season. The only restrictions are that each competitor may submit only one photograph and that this must have been taken by him. On the back of the print he should state exactly what the picture represents and remember also to give his name, age and full address.

The competition will be in two sections,

A for readers aged 16 and over, and B for those under 16. Each competitor must state in which section his photograph is entered. There will be separate Overseas Sections, and in each section prizes of 21/-, 15/- and 10/6 will be awarded. Entries should be addressed: *Spring Photographic Contest, Meccano Magazine Binns Road, Liverpool 13*. Closing dates: Home Section: 30th April; Overseas Section: 31st July.

Competitors who desire their entries to be returned should note the paragraph at the top of this page.



# Competition Results and Solutions

## HOME

### NOVEMBER 1953 PHOTOGRAPHIC CONTEST

1st Prize, Section A: S. C. Reynolds, Lowestoft. Section B: W. Lascom, Manchester. 2nd Prize, Section A: E. Gater, Stoke-on-Trent. Section B: M. Topliss, Woodlands. 3rd Prize, Section A: J. L. Springett, London S.E.20. Section B: A. J. Cubie, Prestbury. Consolation Prizes: S. Buck, Seascale; G. Shipley, Stoke-on-Trent; C. Hood, Preston; M. Honey, Faversham.

### DECEMBER 1953 ADVERTISEMENT CONTEST

1st Prize: W. A. Clough, Newport. 2nd Prize: R. R. Burnett, Dunfermline. 3rd Prize: R. F. Hughes, Hounslow. Consolation Prizes: G. Hopkins, Sevenoaks; V. Horn, Taunton; M. Summers, Colne.

### DECEMBER 1953 BRIDGES CONTEST

1st Prize: G. T. Wilson, London E.11. 2nd Prize: L. F. Fletcher, Rochdale. 3rd Prize: R. Thomas, Winchester. Consolation Prizes: C. E. Wrayford, Bovey Tracey; E. G. Rudkin, Chaddesden; T. Moore, Chelmsford.

### DECEMBER 1953 PHOTOGRAPHIC CONTEST

1st Prize, Section A: S. Redhead, Hull; Section B: P. Biagi, Irvine. 2nd Prize, Section A: H. E. Huxley, Ellesmere Port; Section B: D. Gowan, Greenford. 3rd Prize, Section A: I. Band, Dundee; Section B: J. I. Booth, Hull. Consolation Prizes: B. Jones, Stratford-on-Avon; J. Church, Glasgow; R. M. Aitken, Edinburgh 7; R. Leslie, Carlisle.

## OVERSEAS

### AUGUST 1953 LOCOMOTIVE CONTEST

1st Prize: F. Hollinger, Karachi, Pakistan. 2nd Prize: B. O. Stanley, Quebec, Canada. 3rd Prize: W. Adair, Paris, France. Consolation Prizes: N. Kerley, Dublin, Eire; R. Hepburn, Gisborne, N.Z.; M. G. G. Harvey, Wellington, S.1, N.Z.

### AUGUST 1953 PHOTOGRAPHIC CONTEST

1st Prize, Section A: A. T. Johnston, Wellington, C.2, N.Z.; Section B: B. W. Bahia, Montevideo, Uruguay. 2nd Prize, Section A: L. Linder, Goteborg, Sweden; Section B: T. Robinson, Hobart, Tasmania. 3rd Prize: Section A: H. Falconar, Quebec, Canada; Section B: C. D. Nelson, Wichita, U.S.A. Consolation Prizes: M. N. Radhakrishna, Mysore, India; S. Puri, New Delhi, India; M. Byrne, Arklow, Eire.

### SEPTEMBER 1953 RAIL TOUR CONTEST

1st Prize: A. K. Bloor, Colombo, Ceylon. 2nd Prize: J. Anthony, Ottawa, Canada. 3rd Prize: H. J. Nelson, Durban, S. Africa. Consolation Prizes: W. Hanssen, Bombay, India; T. Kooka, Porto, Portugal; F. Goddard, Dunedin, N.Z.

### SEPTEMBER 1953 FIGUREWORD CONTEST

1st Prize: L. H. Beck, Sydney, Australia. 2nd Prize: J. Gleave, Madras, India. 3rd Prize: G. Watkinson, Durban, S. Africa. Consolation Prizes: A. J. Brown, Mosgiel, N.Z.; K. Howard, Kandy, Ceylon; P. Burman, Rotterdam, Holland.

### SEPTEMBER 1953 PHOTOGRAPHIC CONTEST

1st Prize, Section A: B. S. Purus, Pernambuco, Brazil; Section B: W. A. Kaduna, Takoradi, Gold Coast. 2nd Prize, Section A: L. Ricardo, Oran, Algeria; Section B: K. C. Doodson, Adelaide, Australia. 3rd Prize, Section A: T. Richards, Port Nolloth, S. Africa; Section B: N. Gibson, Kandy, Ceylon. Consolation Prizes: R. McArthur, Greymouth, N.Z.; J. Xuereb, Valletta, Malta G.C.; S. D. Grover, Dehra Dun (U.P.), India; D. Hill, Pretoria, S. Africa; D. L. Pascoe, Christchurch, N.Z.; P. G. Habersberger, Victoria, Australia.

### OCTOBER 1953 PHOTOGRAPHIC CONTEST

1st Prize, Section A: F. Medaglia, Quebec, Canada; Section B: J. K. Distant, Paris, France. 2nd Prize, Section A: N. E. Burke, Stockholm, Sweden; Section B: W. Robinson, Lower Hutt, N.Z. 3rd Prize, Section A: L. T. Gamblin, Christchurch, N.Z.; Section B: K. Hewitt, Cairo, Egypt. Also four consolation prizes.

## SOLUTIONS

### SEPTEMBER 1953 FIGUREWORD CONTEST

Hastings, Airliner, Nacelles, Canberra, Controls, Turbojet, Fuselage, Pembroke, Dihedral, Argonaut.

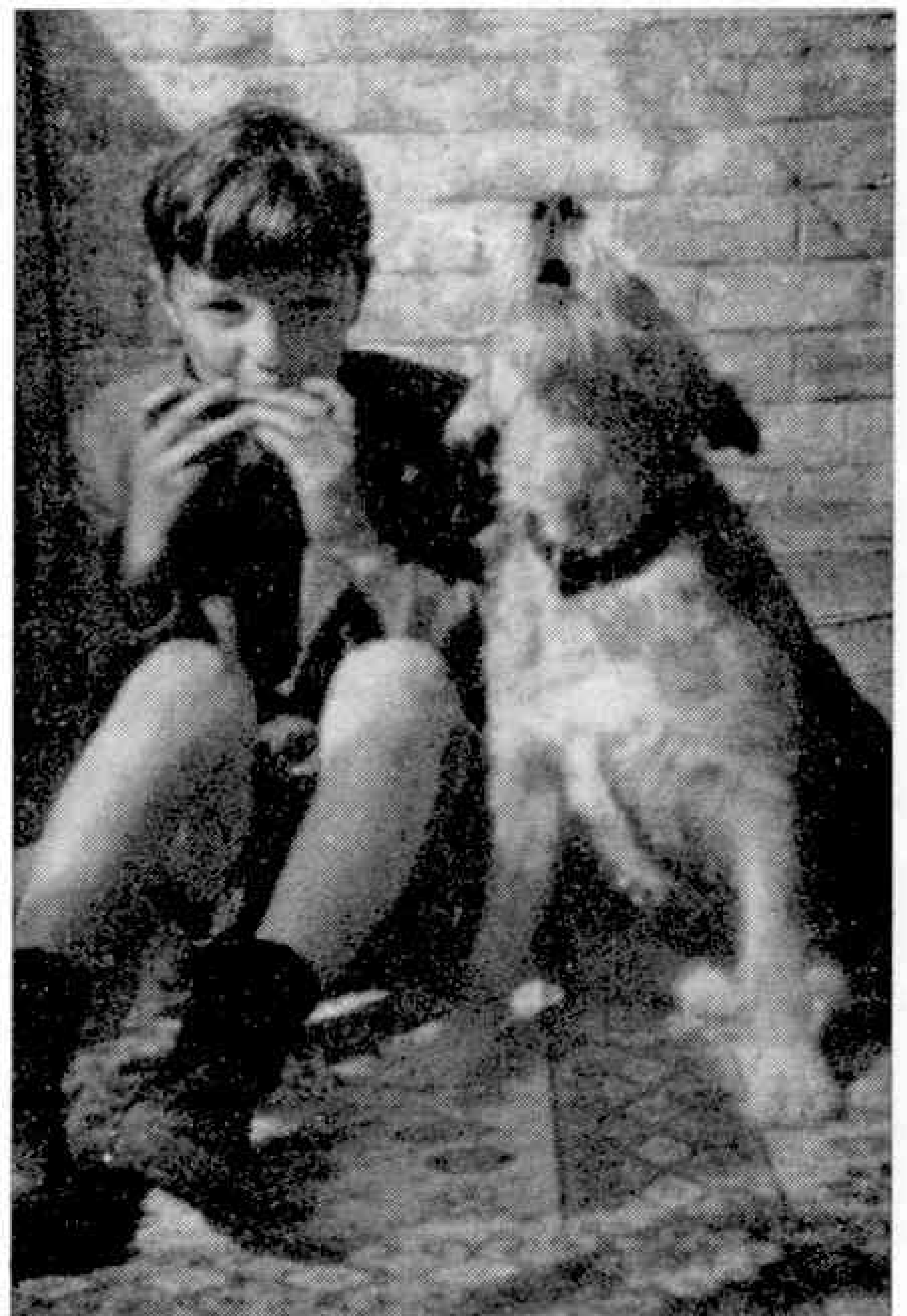
### SEPTEMBER 1953 RAILWAY CONTEST

Tay and Forth bridges; Runcorn, Middlesbrough and Newport transporter bridges; Severn tunnel; underground track between Morden and East Finchley (via Bank); The Liverpool Overhead Railway; Crewe; longest platform is in Manchester and stretches from Victoria Station to Exchange Station.

### OCTOBER 1953 LOCOMOTIVE CONTEST

(1) City of Salford, 46257, 4-cyl., 4-6-2 Princess Coronation. L.M.R. (2) Iron Duke, 70014, 2-cyl., 4-6-2 Britannia. B.R. standard. (3) Sir Constantine, 30805, 2-cyl., 4-6-0 King Arthur. S.R.\* (4) Barbury Castle, 5095, 4-cyl., 4-6-0 Castle. W.R. (5) Strang Steel, 61244, 2-cyl., 4-6-0 B.I. E.R. (6) The Boy Scout, 46169, 3-cyl., 4-6-0 Royal Scot. L.M.R. (7) Clan Buchanan, 72000, 2-cyl., 4-6-2 Clan. B.R. standard. (8) Duchess of Kent, 46212, 4-cyl., 4-6-2 Princess Royal. L.M.R. (9) St. Lawrence, 30934, 3-cyl., 4-4-0 Schools. S.R. (10) Caradoc Grange, 6873, 2-cyl., 4-6-0 Grange. W.R. (11) Ellerman Lines, 35029, 3-cyl., 4-6-2 Merchant Navy. S.R. (12) Durham School, 60860, 3-cyl., 2-6-2 V.2. E.R.

\* Due to a misprint the number of this locomotive was given as 30806 in the October M.M., but most readers managed to spot the error.



"Duet"—you can vividly imagine the howling! This humorous snap by Paul Biagi, Irvine, was awarded 1st prize in Section B of the December 1953 Photographic Contest.

# Fireside Fun

"What is the meaning of the word average?" asked the school teacher.

"Please, miss," answered a small boy, "It's a thing that hens lay eggs on."

"How do you make that out?" asked the astonished lady.

"Well miss," said the boy, very seriously, "I read in a book that a hen lays on an average once a day."

An artist was painting in the jungle, watched from the undergrowth by two leopards.

"Don't you think we ought to be going?" said one.

"No," answered the other. "He hasn't spotted us yet."

Mike: "Did you ever tickle a mule?"

Moe: "No."

Mike: "You ought to try it some time; you'd get a big kick out of it."

Prison Chaplain: "Why are you back here again, Joe?"

Joe: "Because of my belief, sir."

Prison Chaplain: "What? How could your belief bring you back here?"

Joe: "I happened to believe that the policeman had already patrolled his beat past the jewellery store."

The angry boss stormed up to the office-boy who was watching a football match. "So this is your uncle's funeral you were going to!" he exclaimed.

Quickly the lad collected his wits. "Looks like it," he answered. "He's the referee."

"Man, Mike, 'tis a long time since I've seen ye. An' how is things wid ye, me bhoy?"

"Bad, Pat, bad. 'Tis these troubled times an' the rationin' an' all. Sure, for the last six months 'tis little more I've been doin' than starin' the wolf in the face."

"Bejabbers, Mike, is that so? An' it can't have been any too plisant for either of ye."

"Hullo, Tommy," said a neighbour to the small boy, and then noticing the gap in the front of his mouth, she added: "How did you lose your tooth?"

"Changing gears on a lollipop," replied the motorist's son.

Officer: "Are you happy now that you're in the Navy?"

Boot: "Yes, sir."

Officer: "What were you before you got into the Navy?"

Boot: "Much happier."



"There's no need to overdo it, Smith Minor!"

Tom: "Dachshunds are not recommended as pets."

Bob: "Why not?"

Tom: "They keep the door open too long going in and out of the house."

At a circus in a nearby town, a man stood thoughtfully looking at the camels. Then he picked up a straw, placed it on the camel's back and waited. Nothing happened.

"Wrong straw," he muttered and walked away.

## BRAIN TEASERS

### A MATTER OF WEIGHTS

A man has a pair of scales and four weights totalling 40 lb. With these he can weigh any object between 1 and 40 nett lb. What are the four weights?

### SQUARING THE NUMBERS

Can you arrange the numbers 1 to 25 in a square so that the numbers in each vertical and horizontal line total 65?

### THE KING IN HIS CASTLE

A King in his castle had a bodyguard of soldiers and he insisted that each night there should be a guard of nine men on each side of the castle, as shown in the sketch below.

One night four of the soldiers were absent. Another night four soldier friends stayed with them. The next night eight friends stayed, and the next night again, twelve friends stayed.

Yet on each of these nights the soldiers and their friends so placed themselves around the castle that whenever the King counted there were always nine men on each side.

Can you find out how the soldiers placed themselves each night?

## SOLUTIONS TO LAST MONTH'S PUZZLES

In our first puzzle the arrangement of the numbers 1 to 9 so that they total 100 is as follows:  $123 - 45 - 67 + 89 = 100$ .

The long English word of 28 letters: Antidis-establishmentarianism.

The six famous characters to which the clues given in our third puzzle refer, are:  
1. Sir Winston Churchill.  
2. Cardinal Wolsey.  
3. Florence Nightingale.  
4. George Washington.  
5. Robert Bruce.  
6. Sir Isaac Newton.

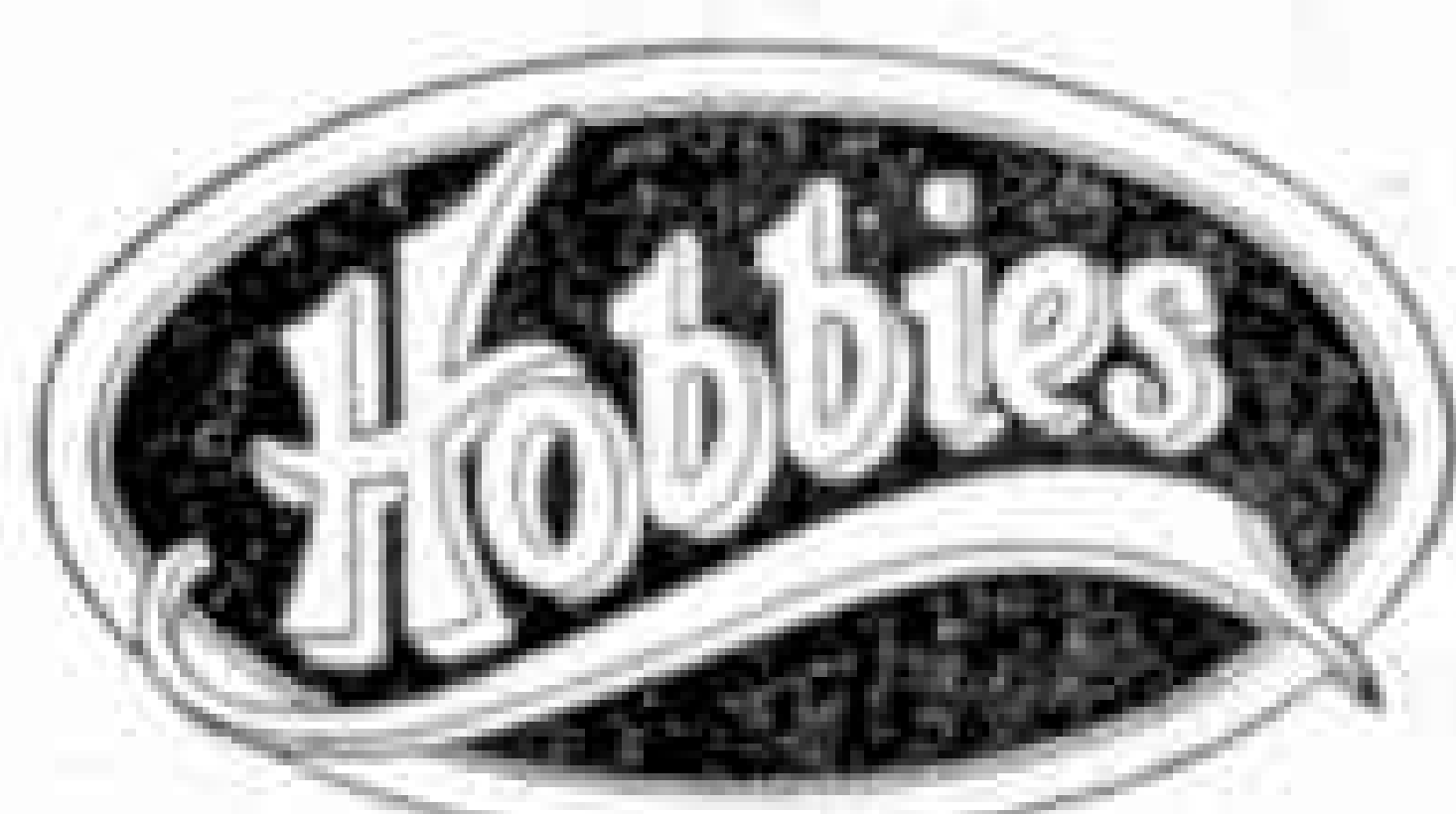
•	• • •	•
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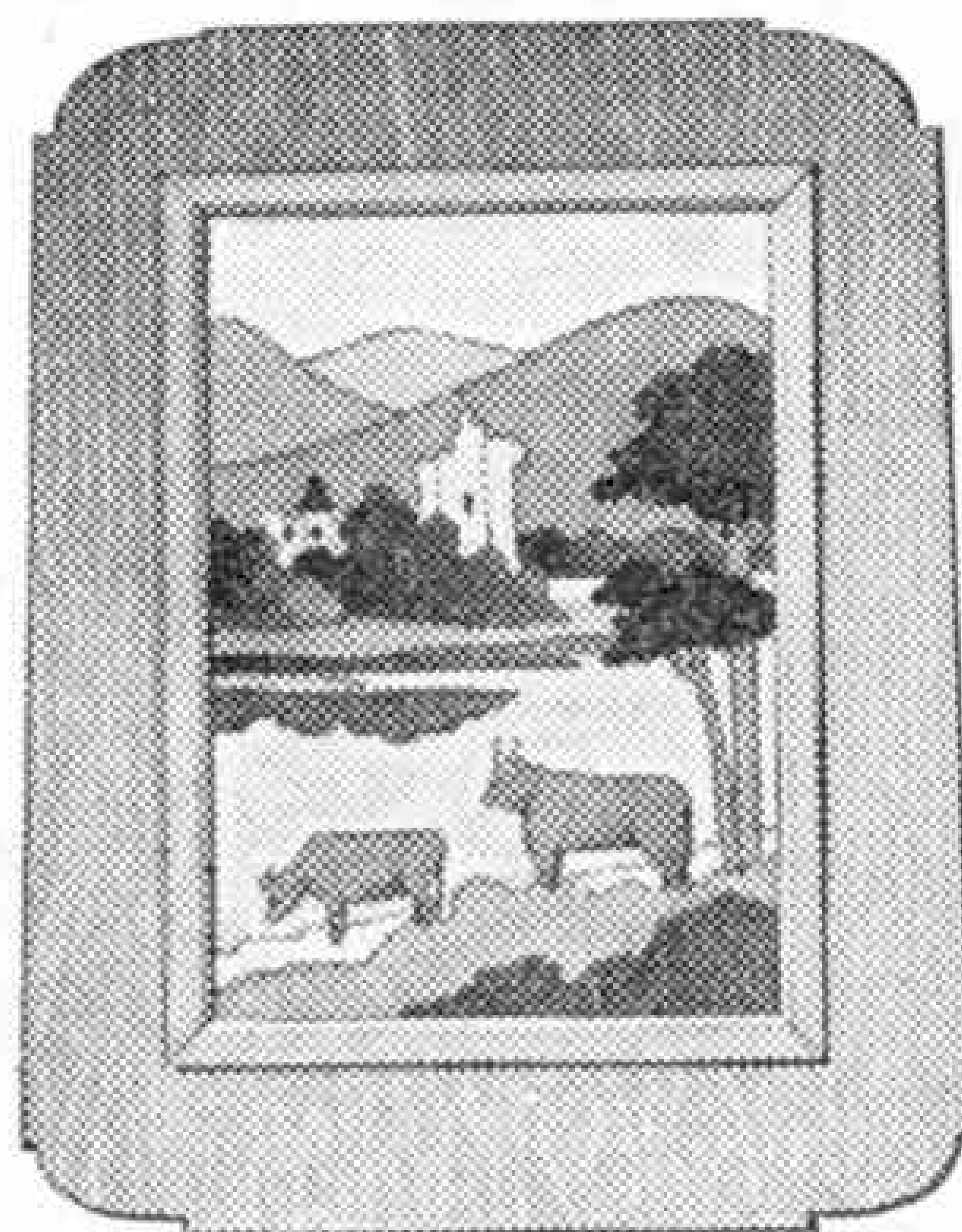
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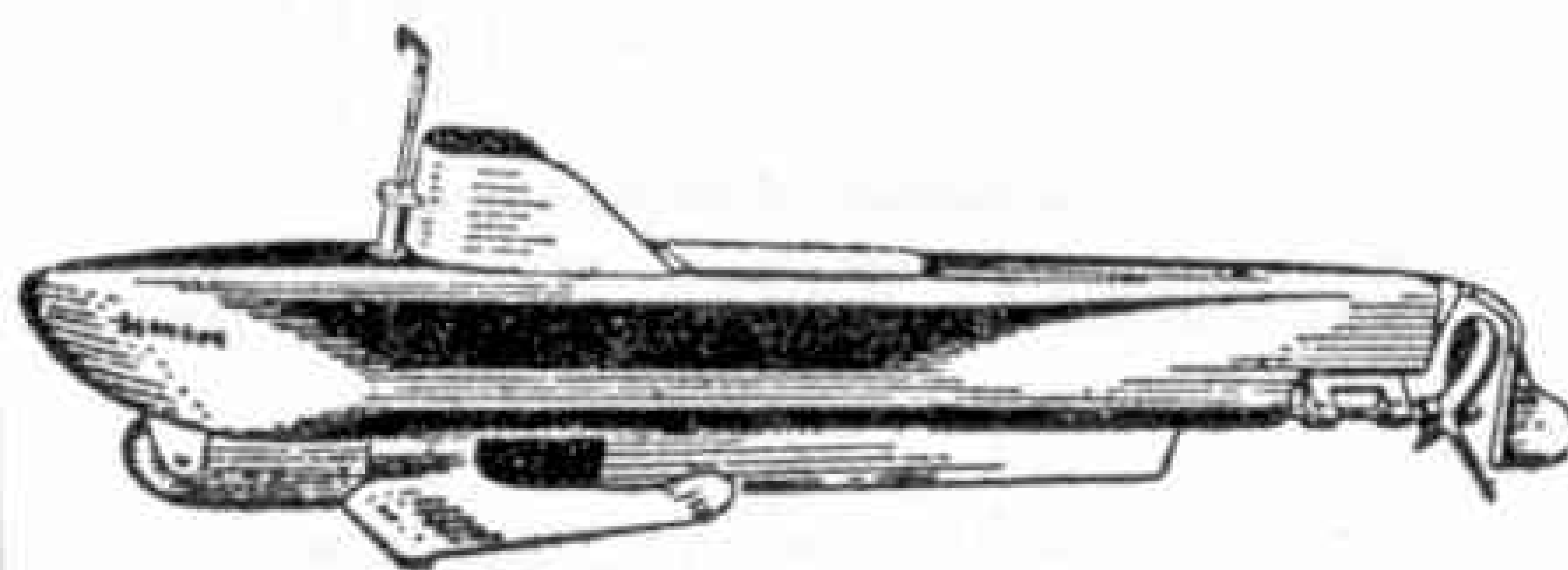


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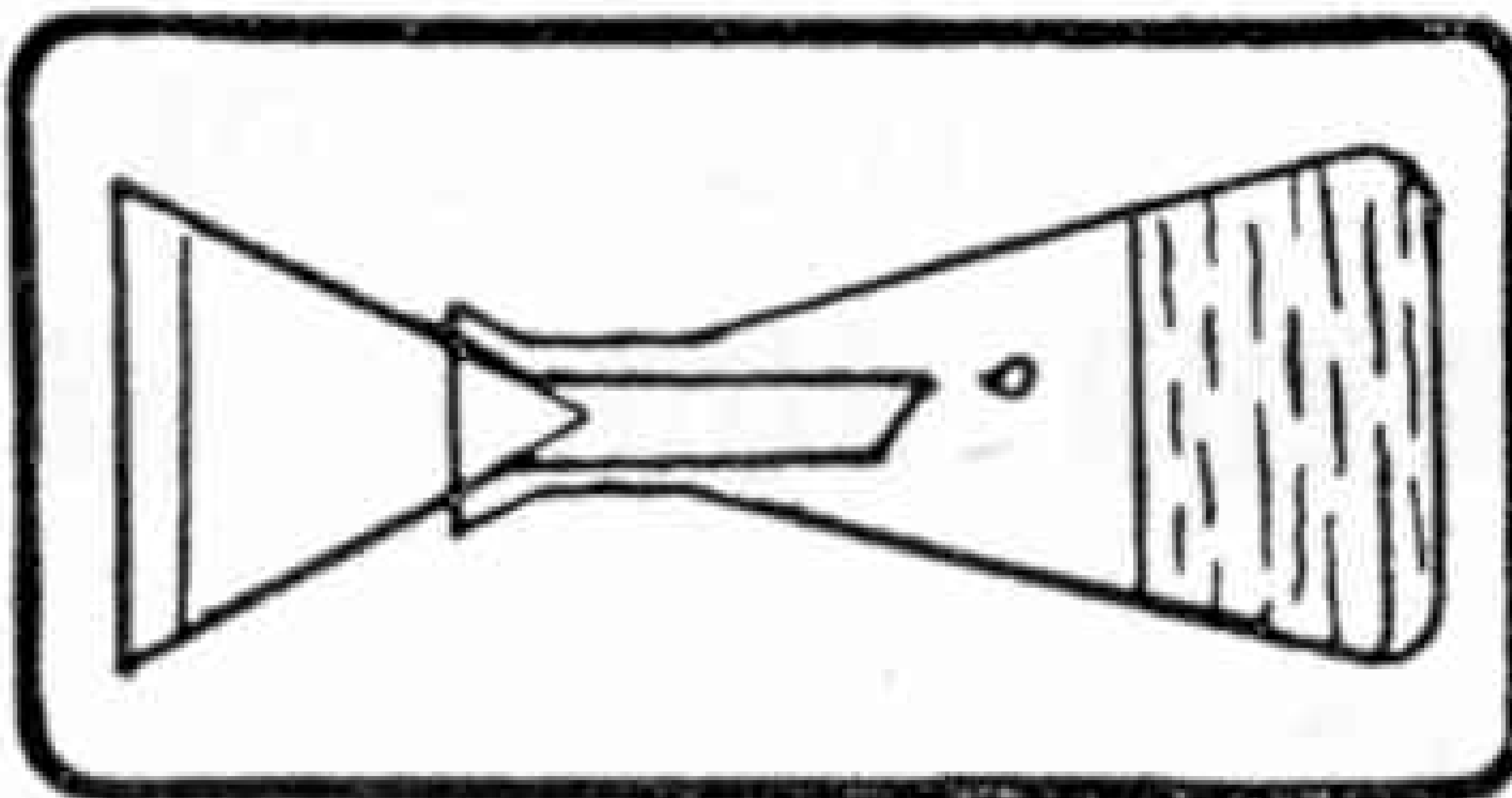
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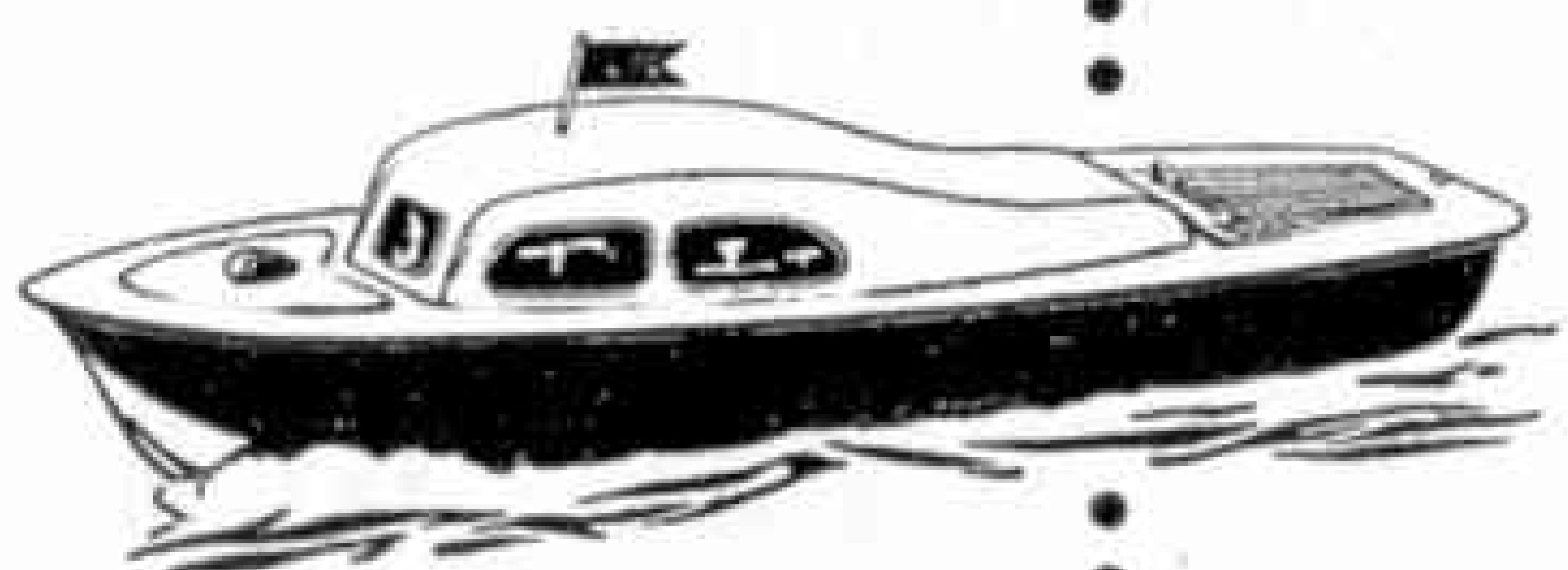
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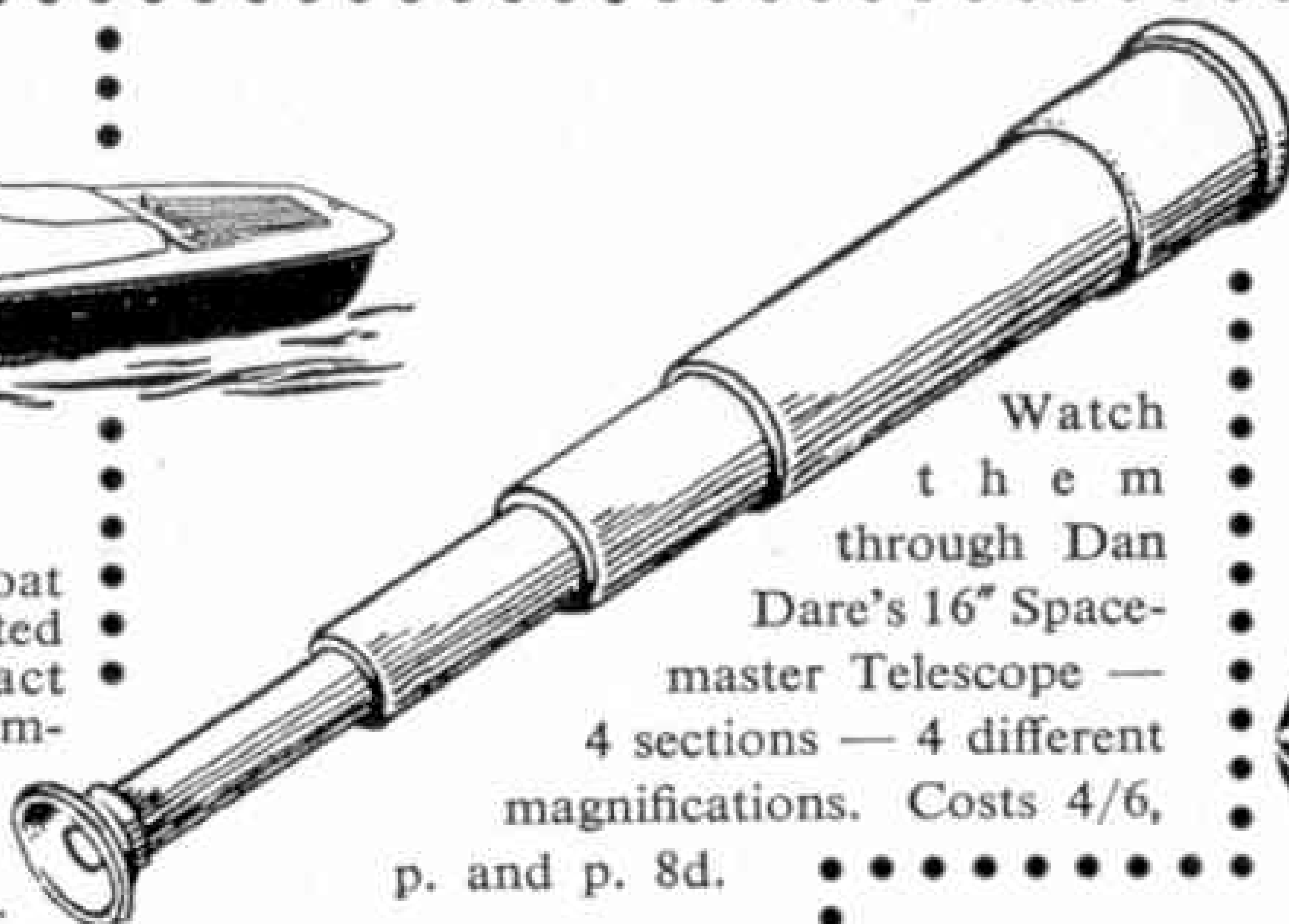
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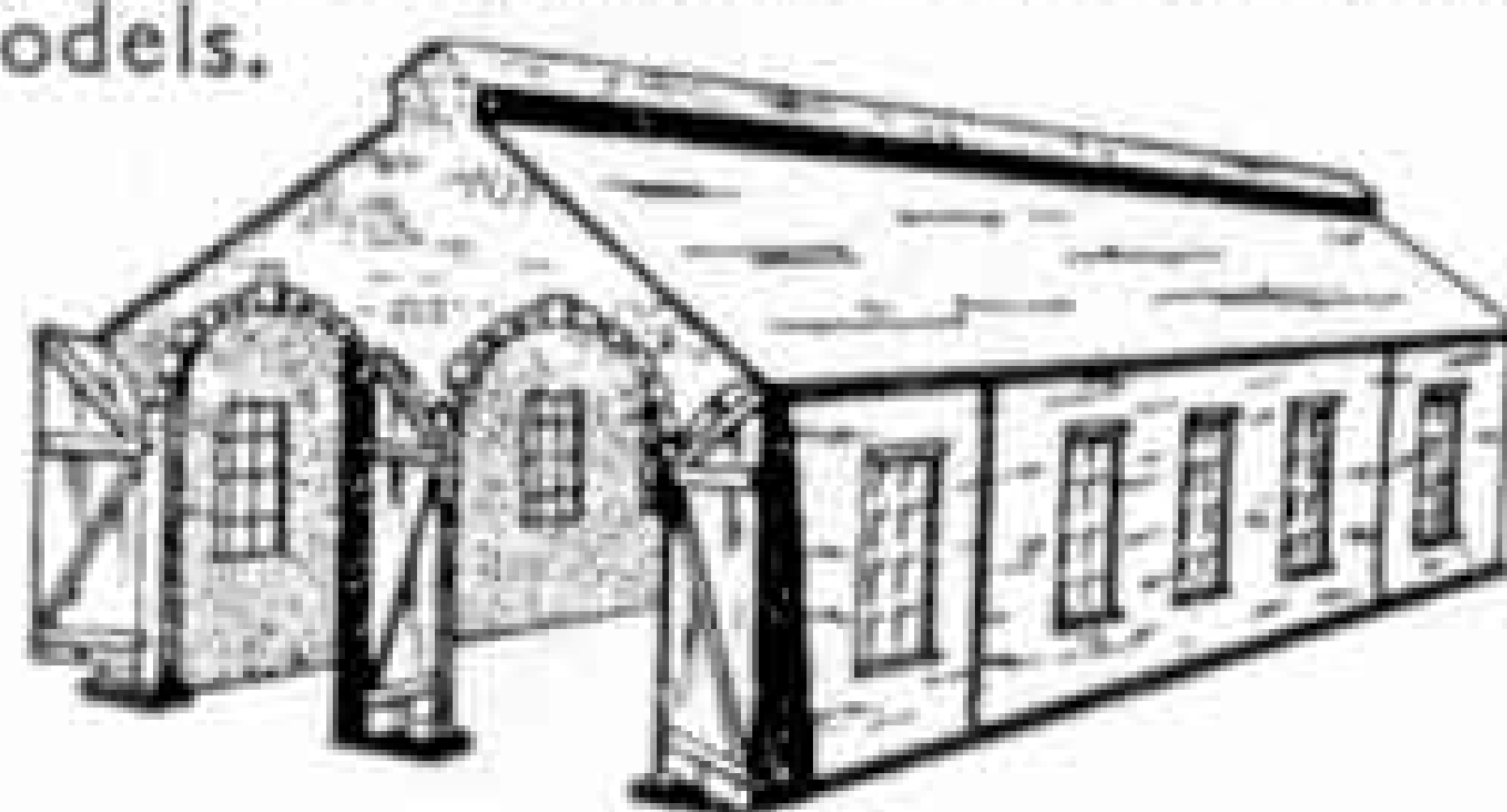
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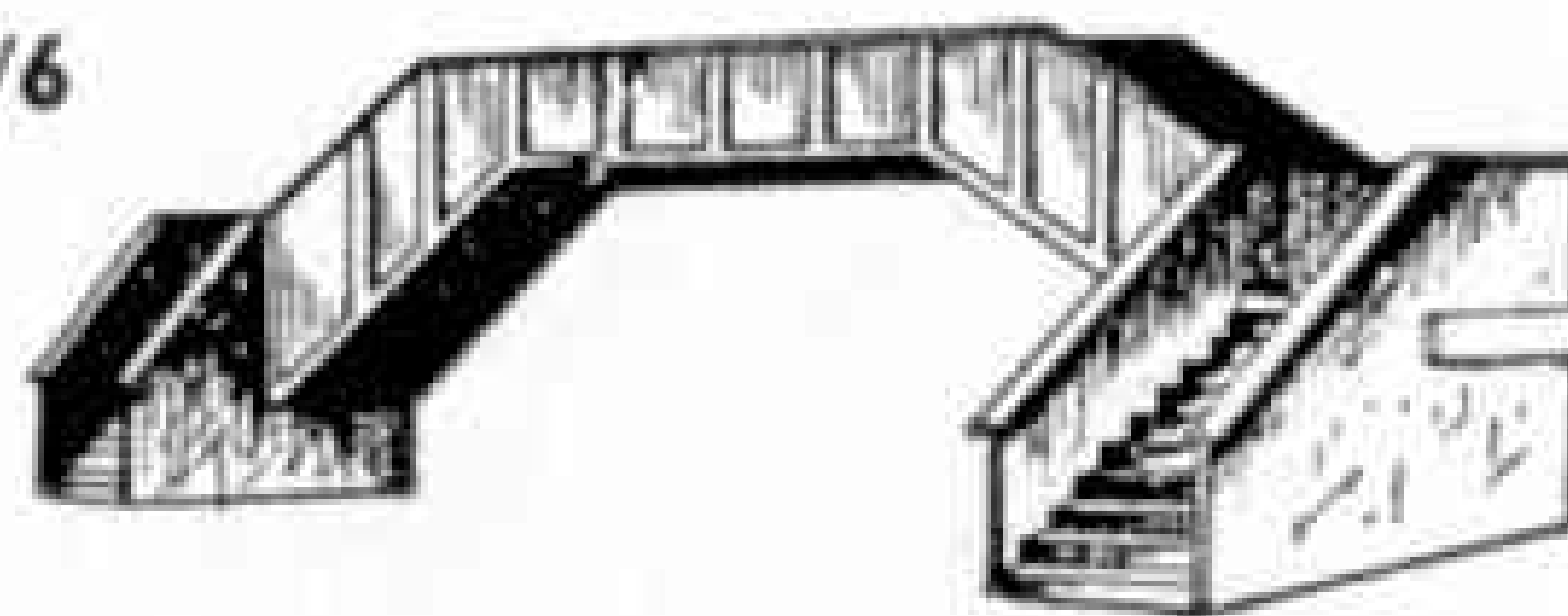
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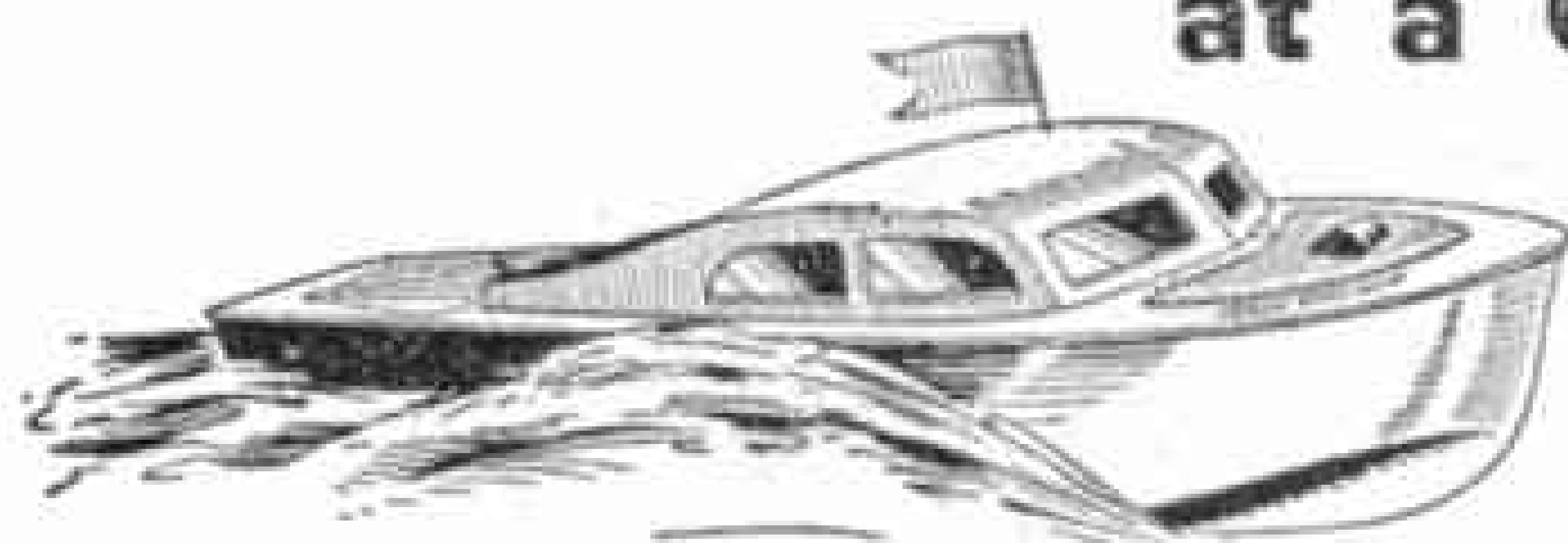
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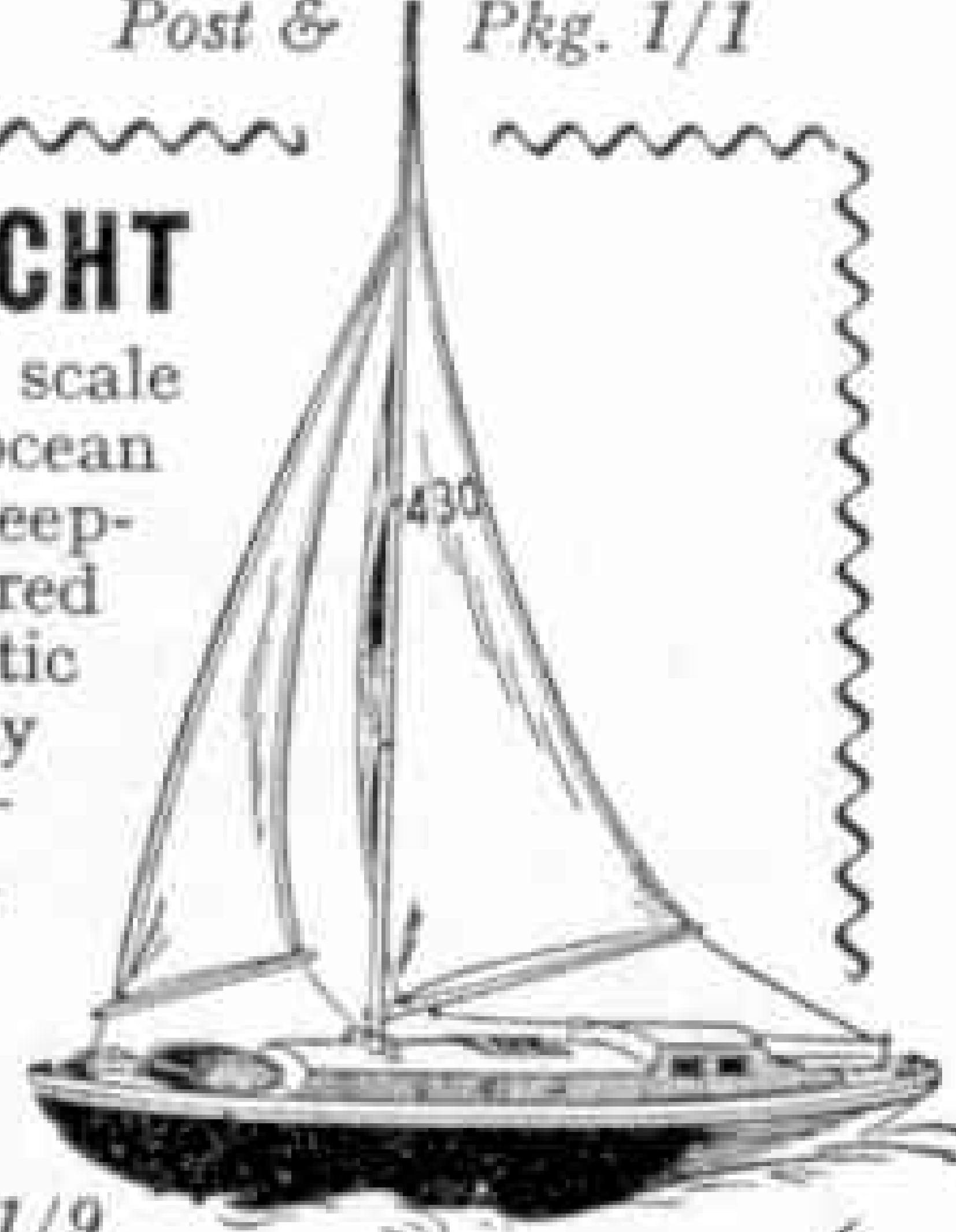


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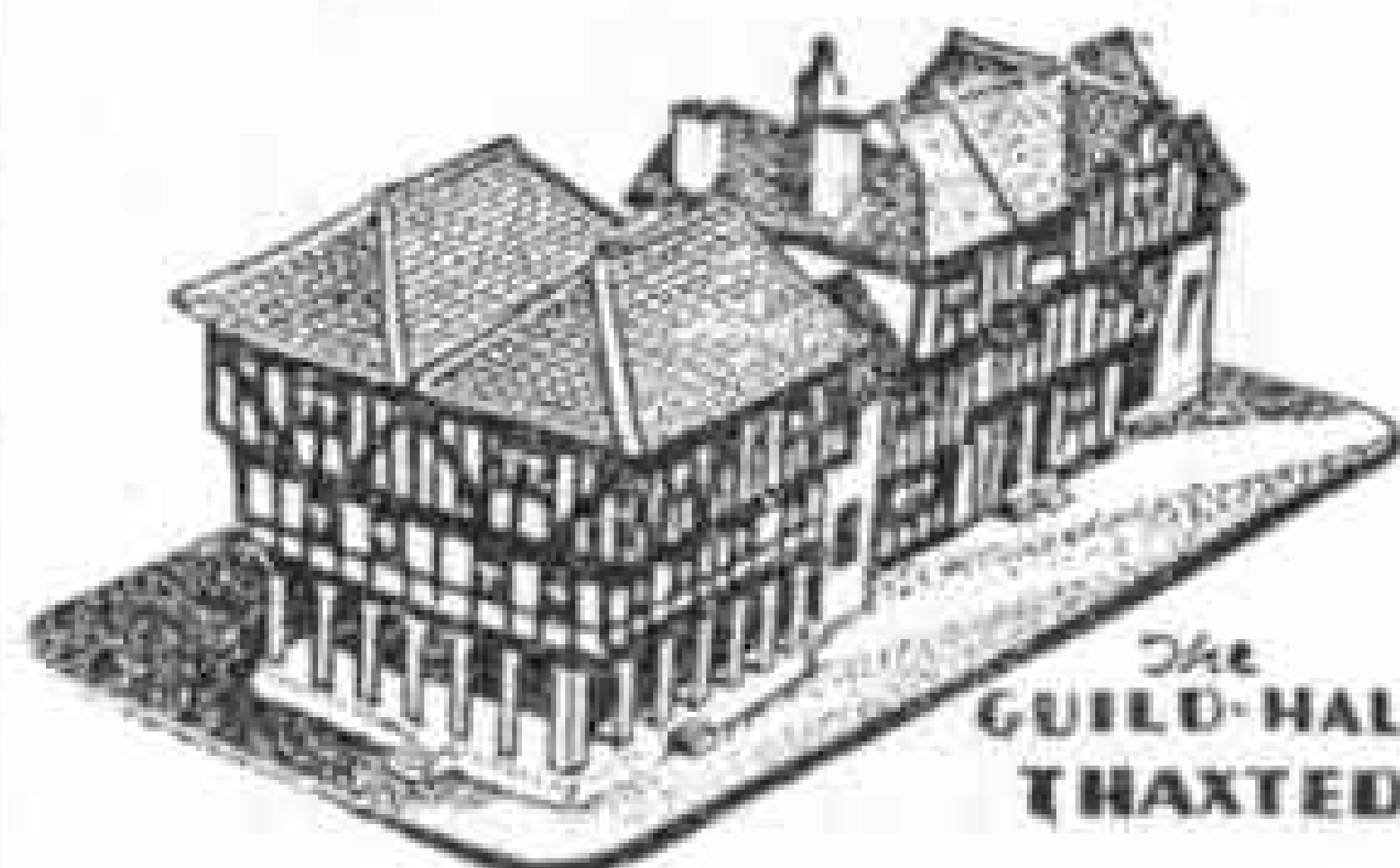
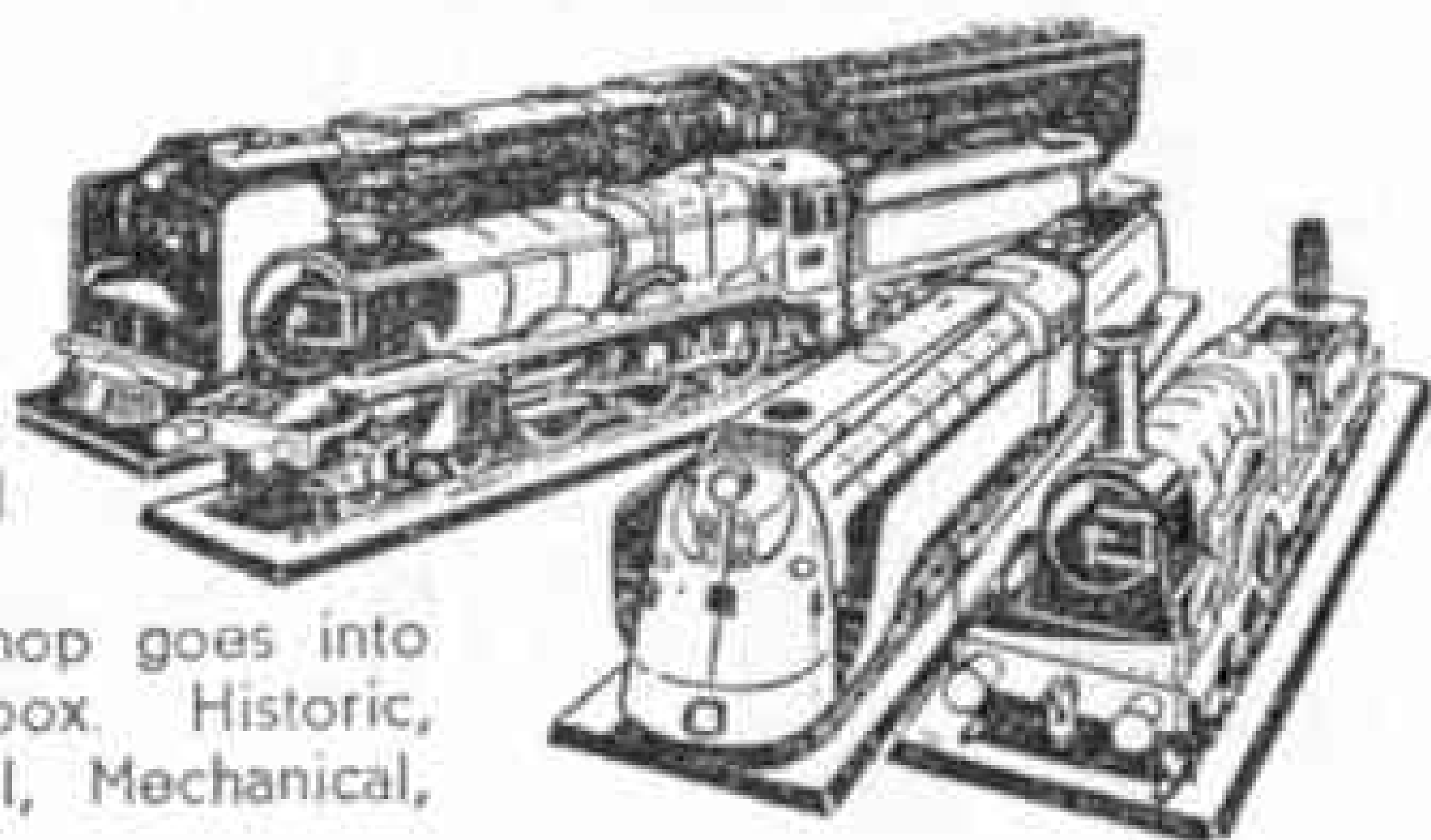
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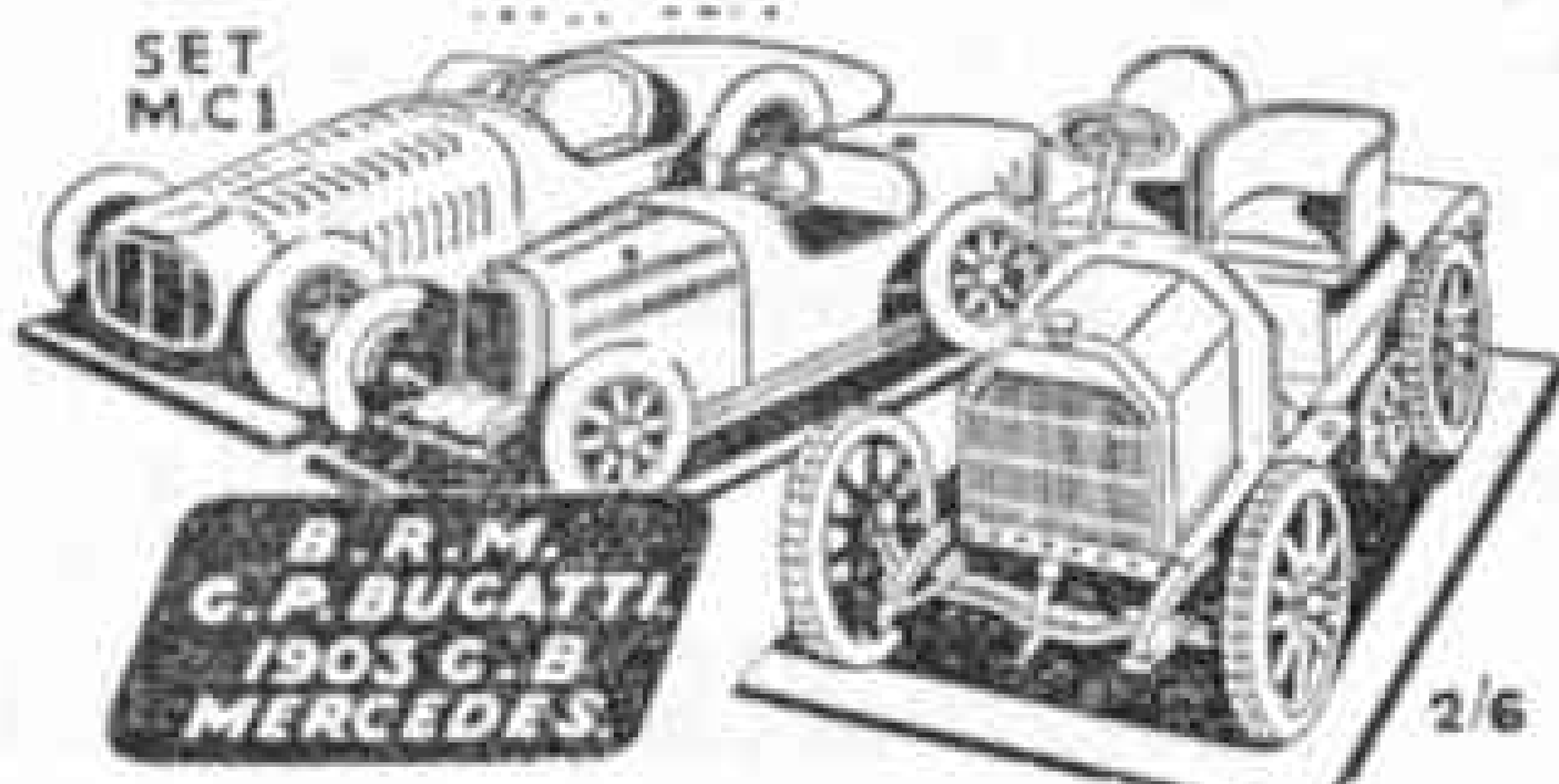
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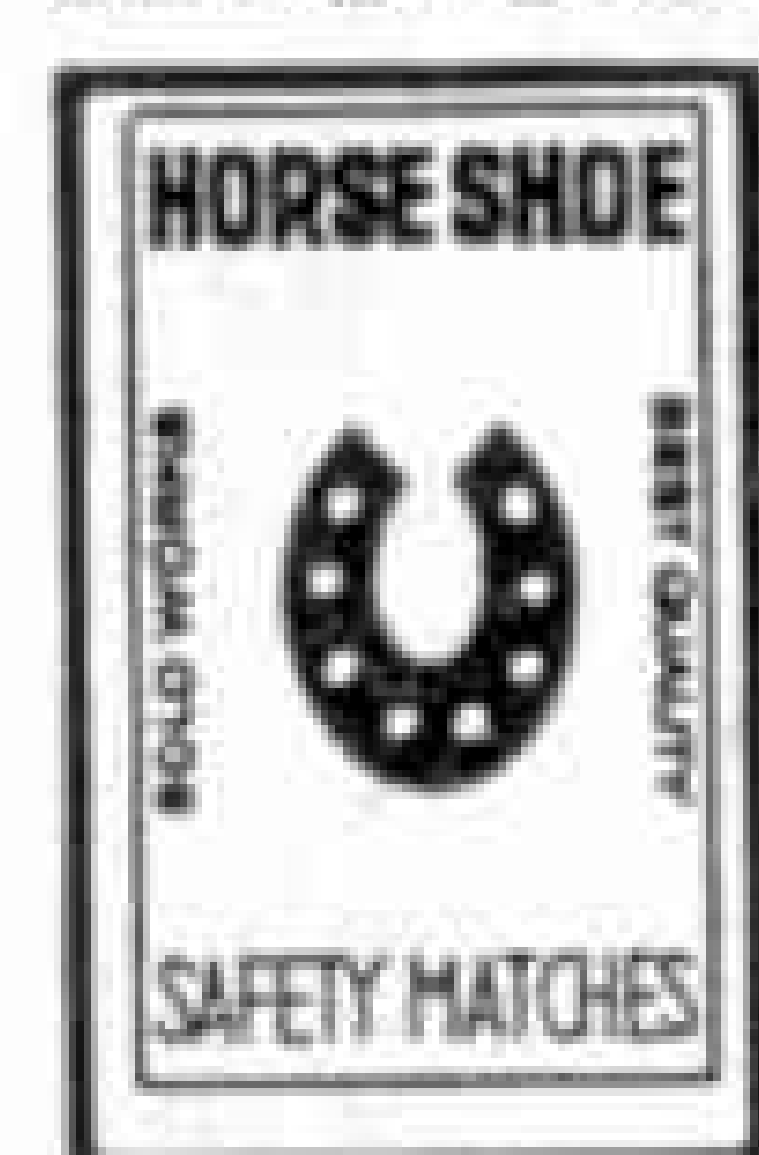
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Good prices for pre-war Instruction Manuals, Meccano Book of prize models, How to use Meccano Parts, etc., or will exchange 1,500 U.S. Mixed (used) commemorative Stamps, U.S. mint Stamps and Super Model Leaflets for any of the above literature. Also wanted, any issue of the U.S. published Meccano Magazine, obsolete Meccano and Electron Parts. Reply by air mail, all replies answered promptly.—F. Harrison, 414 Piatt, Wichita 7, Kansas, U.S.A.

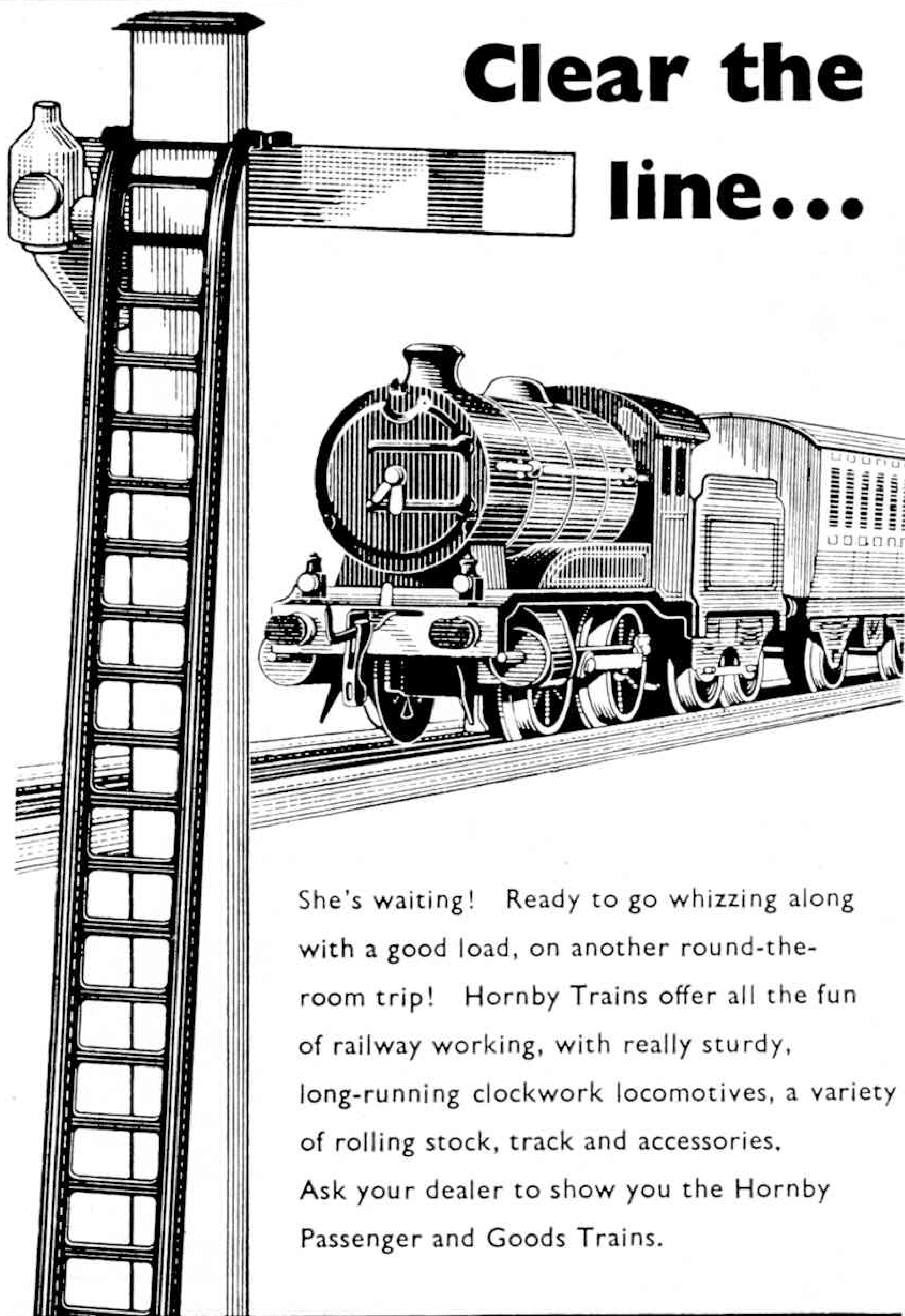
"Chums" Annuals of the following dates wanted: 1910, 1912, 1916, 1918, 1919, 1920, 1924 to 1928, 1931–32, 1932–33, 1935–36, 1936–37. Also Boy's Own Annuals of any date. State your price or will exchange for anything you may require from New Zealand. Reply airmail to—R. Goodison, 24 Rautara Street, Orakei, Auckland, E.1, New Zealand.

Dinky Toys Tramcars, Mailvans and Pillar Boxes (pre-war). State price and condition. Also exchange N.Z. Shells for British Shells. Apply—D. Fairfax, 102 Cemetery Road, Naenae, New Zealand.

Enthusiast wishes to borrow issues 1 to 18 of "M.M." for few days. Fee payable by arrangement. Please state issues available.—Burgess, 72 Herne Hill London S.E.24.



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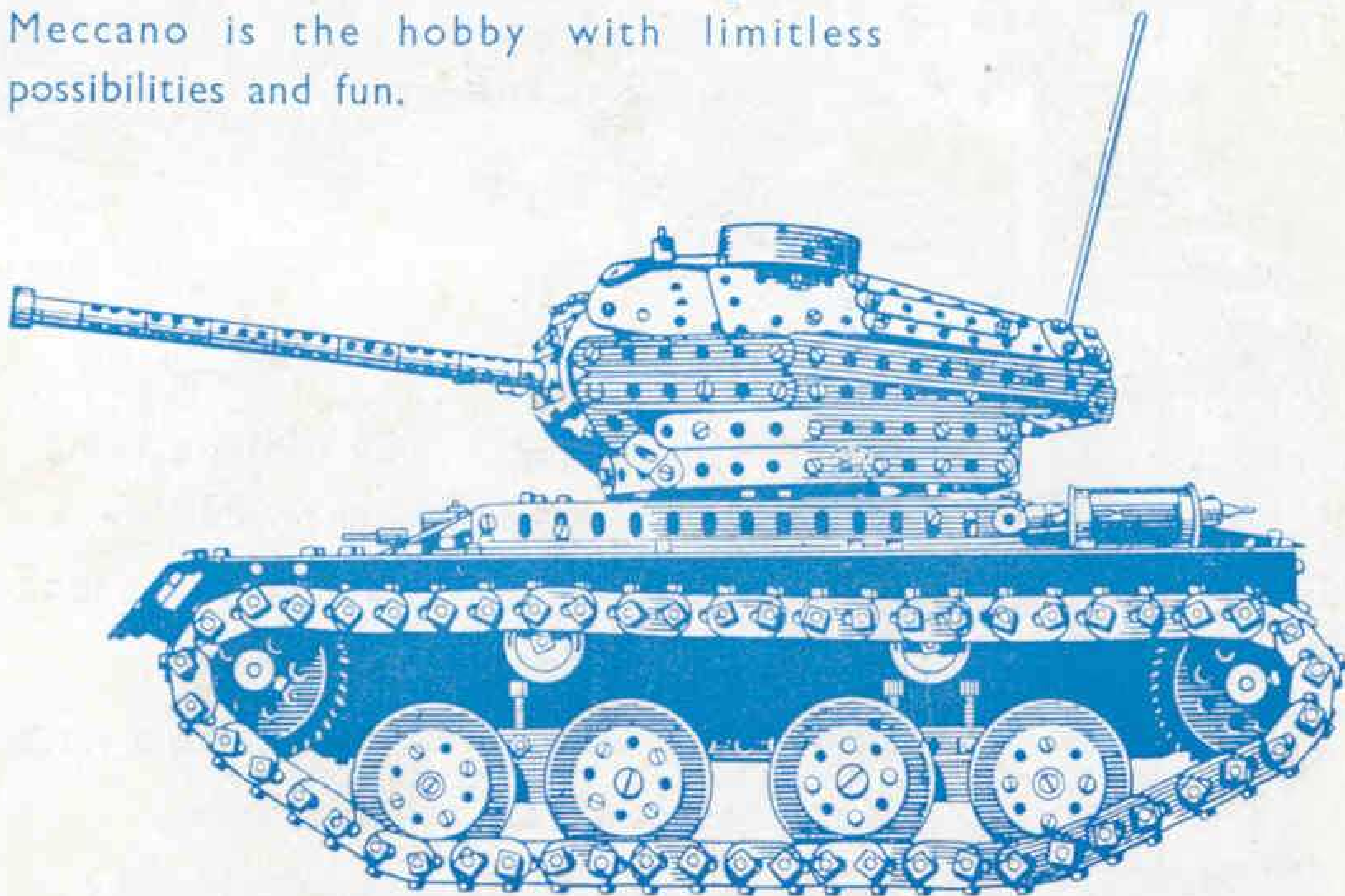
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